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FOOD TECHNOLOGY ABSTRACTS

Vol. 29 No. 1
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FOOD TECHNOLOGY ABSTRACTS

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ABBREVIATIONS

A	ampere
AAS	atomic absorption spectrometry
ADP	adenosine diphosphate
Anon.	Anonymous
AOAC	Association of Official Analytical Chemists
approx.	approximately
atm	atmosphere
ATP	adenosine triphosphate
a_w	water activity
BHA	butylated hydroxyanisole
BHT	butylated hydroxytoluene
BOD	biological oxygen demand
b.p.	boiling point
Btu	British thermal unit
c-	centi- [as in cm, cm^2, cm^3]
cal	calorie
cd	candela
°C	degree centigrade
Ci	curie
CMC	carboxymethyl cellulose
COD	chemical oxygen demand
coeff.	coefficient
conc.	concentrated
concn.	concentration
cv.	cultivar
cwt	hundredweight
d-	deci-
DE	dextrose equivalent
detn.	determination
DFD	dark firm dry
diam.	diameter
dil.	dilute
DM	dry matter, Deutsche Mark
DNA	deoxyribonucleic acid(s)
dyn	dyne
E.	East, Eastern, etc
ECD.	electron capture detection
EDTA	ethylenediaminetetraaceti acid
Eh	oxidation-reduction potential
ELISA	enzyme-linked immunosorbent assay
f-	femto-[10^{-15}, as in fCi]
°F	degree Fahrenheit
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
FID	flame ionization detection
fl oz	fluid ounce
f.p.	freezing point
ft	foot, feet
g	gram
GC	gas chromatography
gr	gravity
gal	gallon
gf	gram-force
GLC	gas-liquid chromatography
h	hour
ha	hectare
HDPE	high density polyethylene
hl	hectolitre [100 l]
hp	horse power
HPLC	high performance/pressure liquid chromatography
HTST	high temperature short tim
Hz	hertz [frequency cycles/s]
in	inch
IR	infrared
IU	international unit
J	joule
k-	kilo- [as in kcalk, kg]
K	Kelvin
l	litre
lb	pound
lbf	pound-force
LDPE	low density polyethylene
m-	milli- [as in mg, ml, mm]
m-equiv	milli-equivalent
M	molar concentration
M-	mega- [as in Mrad]
max.	maximum
min	minute [time]
min.	minimum
mol	mole
mol.wt.	molecular weight
m.p.	melting point
MPN	most probable number
MS	mass-spectrometry
n-	nano-[10^{-9}, as in nm]
N	Newton [kg m/s^2]
N.	North, Northern, etc
N	Normal concentration
NMR	nuclear magnetic resonance
NPU	net protein utilization
oz	ounce
p-	pico- [10^{-12}, as in pCi]
P	Poise
p	probability
Pa	pascal (N/M^2)
PAGE	polyacrylamide gel electrophoresis
PER	protein efficiency ratio
p.p.b.	parts per billion
p.p.m.	parts per million
PSE	pale soft exudative
PTFE	polytetrafluorethylene
PVC	polyvinyl chloride
PVDC	polyvinylidene chloride
qt	quart
R	rontgen
rad	rad or radian
ref.	reference(s)
rev/min	revolutions per minute
RH	relative humidity
RNA	ribonucleic acid(s)
S.	South, Southern, etc.
s.d.	standard deviation
SDS	sodium dodecylsulphate
s.e.	standard error
s	second [time]
SNF	solids-not-fat
sp.,spp.	species
sp.gr.	specific gravity
summ.	summary
Suppl.	Supplement
t	metric tonne
temp.	temperature
TLC	thin layer chromatography
TS	total solids
UHT	ultra-high temperature
UV	ultraviolet
V	volt
var.	variety
vol.	volume
v/v	volume/volume
W	watt
W.	West, Western, etc.
WHO	World Health Organization
w/v	weight/volume
wk	week
wt.	weight
yd	yard
yr	year
μ	micro–[as in g, μm]
%	per centum
>	greater than
≥	greater than or equal to; not less than
<	less than
≤	less than or equal to; not greater than

ABBREVIATIONS FOR LANGUAGES

Language of text	
Dutch	Nl
French	Fr
German	De
Italian	It
Japanese	Ja
Norwegian	No
Spanish	Es
Swedish	Sv

GENERAL

1

Bryan (FL). **HACCP - Street vending in developing countries.** *Food Australia* 45(1); 1993; 80-84

Review article covers, the conditions of street vending, street vending and foodborne disease, microbial contamination of street-vended foods, hazard analysis for street-vended foods critical control points in street-vending, verification of safety of street-vended foods and towards safe street-vended foods. 20 references. SRA

2

Wrick (KL), Friedman (LJ), Brewda (JK) and Carroll (JJ). **Consumer viewpoints on "designer foods".** *Food Technology* 47(3); 1993; 94, 96, 98, 100, 104

The survey broadly explores the attitudes about diet-health relationships and some of the responses were used in the design and implementation of two employee focus groups. The focus group discussions were inturn used as a guide in developing a series of questions for the third phase of work, a national telephone survey. CSA

FOOD PROCESSING

3

Sgaramella (S) and Ames (JM). **The development and control of colour in extrusion cooked foods.** *Food Chemistry* 46(2); 1993; 129-132

Wheat starch, glucose and lysine mixtures at 96:3:1 and 92:6:2 (m.m.m.) with 13, 15 and 18% moisture contents were extrusion cooked at 125 and 135°C target die temp. CIELAB L*a*b* measurements for ground extrudate samples showed that increasing die temp. or the amounts of glucose and lysine or decreasing moisture content increased the colour intensity and decreased L* and increased a* and b* values. Decreasing moisture content from 18 to 13% had greater influence on colour development than increasing die temp. Moisture contents of 13 and 15% resulted in better expanded products than 18% moisture. SD

4

Kres-Rogers (E). **New and emerging instrumentation for quality assurance.** *Trends in Food Science and Technology* 4(2); 1993; 35-41

This article examines instrumentation needs, particularly for the on-line measurement of both physical properties and chemical composition. Instrumentation and sensor technologies to meet these needs are highlighted. The role of developments in mathematical methods and software for instrument optimization and interpretation of the readings is also highlighted. 41 references. BV

5

Seng (SC) and Babji (AS). **The effect of cook-chill system on the microbiological status of some Malaysian meals.** *ASEAN Food Journal* 8(3); 1993; 94-98

FOOD PACKAGING

Packaging materials

6

Indiramma (AR), Baldev Raj, Kamalamma (V), Balasubrahmanyam (N) and Veerraju (P). **Migratory aspects of food packaging materials with food simulating solvents N-heptane and N-hexane.** *Deutsche Lebensmittel-Rundschau* 88(9); 1992; 279-282

To evaluate the safety of use of plastic packaging materials for food contact application, health organisations world over have laid down specification for limits of extractives in typical food simulants at different time and temp. conditions depending on the end use of the plastic packaging materials. The effect of factors like temp., time, fat simulating solvent n-hexane and n-heptane and thickness of the film on the amount of extractives has been studied. The amount of migrants/unit

area are observed:to increase (1) with time obeying Fick's law of diffusion, (2) linearly with thickness up to 700 guage studied and (3) exponentially with temp. AA

FOOD ENGINEERING AND EQUIPMENT

7

Fakhouri (MO) and Ramaswamy (HS). **Temperature uniformity of microwave heated foods as influenced by product type and composition.** *Food Research International* 26(2); 1993; 89-95

Temp. uniformity following microwave heating was studied with commercially refrigerated and frozen foods, as well as with several food models formulated by incorporating different combinations of protein and fat into a starch gel. Commercialy produced foods microwave-heated according to manufacturer's instructions generally showed large temperature nonuniformity with centre temp. below 70°C (except with frozen lasagna). Temp. uniformity could be improved by heating at lower power levels for longer periods. Product composition influenced the rate and the temp. uniformity in the food model, with added fat improving both. AA

8

Jain (SK), Charan (R), Thayya (A) and Goyal (A). **Specific heat of whole milk, mosami juice and pineapple juice.** *Beverage and Food World* 20(2); 1993; 26-27

This paper presents the methodology for detn. of specific heat of liquid foods by Newton's Law cooling apparatus. The specific heat at various concn. of whole milk, mosami juice and pineapple juice are mentioned in the paper. It was observed that the specific heat decreased with increase in concn. of liquid foods. This decrease in specific heat with increase in total solid content was linear for all three liquid foods. SRA

9

Rose (SA). **The importance of temperature control in distribution of chilled and frozen foods.** *Beverage and Food World* 20(4); 1993; 16-17

Briefly discusses the factors influencing the microflora of frozen and chilled foods, storage changes, recommended temp. and legislation. BV

ENERGY IN FOOD PROCESSING

Nil

FOOD CHEMISTRY AND ANALYSIS

Chemistry

10

Srikumar (TS). **The mineral and trace element composition of vegetables, pulses and cereals of Southern India.** *Food Chemistry* 46(2); 1993; 163-167

Zn, Fe, Mn and K were higher in wheat than in rice and pulses; Zn, Cu, Mg, Se, Ca and Fe higher in wheat, rice and pulses than vegetables and Pb, Cd and Hg were higher in wheat, rice and amaranth leaves than pulses. Zn, Cu, Mg, Ca and Se were higher in lady's finger than raw plantain, brinjal and amaranth leaves. The estimates of daily intake of Zn, Ca were inadequate; Cu, Mg, Se, Mn and Fe sufficient; Pb, Hg below and above the tolerable daily intake. SD

11

Jarms (U), Maier (HG) and Hillmar (S). **Acids of the chicory root. IV. The balance of malic and citric acid during roasting.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 245-248 (De)

Malic and citric acids were determined by enzymatic analysis in a series of roasted chicory roots. The content of these acids decreased to about 30% with increasing degree of roast: 37% of the malic acid and 44% of the citric acid formed compounds with soluble and

insoluble substances in the chicory root. These compounds can be hydrolysed by alkali. According to model experiments they appeared to be esters. These esters represent the main products during roasting besides the products of dehydration and decarboxylation and volatile compounds. AA

Chemistry(Analytical)

12

Finglas (PM), Faure (U) and Southgate (DAT). **First BCR-intercomparison on the determination of folates in food.** *Food Chemistry* 46(2); 1993; 199-213

In all 18 participants from 8 countries participated adopting 4 methods viz., microbiological assay (MA), HPLC, radio protein-binding assay (RPBA) and enzyme protein-binding assay (EPBA). Results indicated reasonable agreement between lab. for detn. of folates in food by MA and possibility of improvements by optimization of the extraction and deconjugation steps especially the choice and preparation of deconjugates enzyme. SD

13

White (JP), Davidson (VJ) and Otten (L). **A capillary viscometer for characterization of fluid foods.** *Food Research International* 26(2); 1993; 109-113

A multi-section capillary viscometer was designed and tested for measuring the rheological properties of food materials (e.g. power-law parameters, thixotropy). The apparatus included a data aquisition system to collect flow rate, temp. and differential pressure measurements as inputs to a BASIC algorithm which computed estimates of the power-law parameters in real time. The apparatus was tested for steady-state and dynamic measurements, and an analysis of the effects of measurement errors on the parameter estimates was completed. Rheological properties of representative food materials (carboxymethyl cellulose sol., pregelatinized starch, locust bean gum) as well as systems with enzymes hydrolysing complex polysaccharides were characterised. AA

14

Ozilgen (S) and Reid (DS). **The use of DSC to study the effects of solutes on heterogenous ice nucleation kinetics in model food emulsions.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 116-120

Effects of sucrose, D-alanine (amino acid with hydrophobic residue) and potassium nitrate on heterogenous ice nucleation kinetics were studied with a differential scanning calorimeter (DSC) in a model food emulsion by employing different solute concn. and ice nucleants: silver iodide (AgI) and *Pseudomonas syringae*. Heterogeneous nucleation rates were described with a mathematical expression in the same form as suggested by the classical homogeneous nucleation theory. Temp. effects on these rates were an exponential function of a parameter defined in terms of the reduced temp. Our results have confirmed that the type of the nucleation template was important in determining the temp. effects of the solutes on the heterogeneous nucleation rates. In the experiments with AgI, values of the model parameters were generally larger than those of the corresponding experiments with *P. syringae*. Observation with AgI/30 g/100 g sucrose solutions indicated extremely high parameter values which might be caused by the change of the catalytic site of AgI molecules and variation of the emulsion properties by highly concentrated sucrose. With the *P. syringae*/D-alanine and AgI/D-alanine systems only modest changes were observed in the model parameters with changing D-alanine concn. Experimental data with the *P. syringae*/KNO_3 system suggested that the heterogeneous ice nucleation rates might be affected by denaturation of catalytic site proteins of *P. syringae* at high salt concn. AA

15

Vilarino (C), Del Giorgio (JF), Hours (RA) and Cascone (O). **Spectrophotometric method for fungal pectinesterase activity determination.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 107-110

A continuous spectrophotometric assay modified for fungal pectinesterases is reported. This method is based on that developed by Hagerman and Austin for plant pectinesterases. The amount of carboxylic

groups released during the assay is calculated from the decrease in absorbance of a pH indicator added to the reaction mixture with a pKi value within the pH range of max. enzyme activity. Bromocresol green was chosen for our modified method as fungal pectinesterases have an optimum activity at acid pHs (4.6 to 5.1) which are within the pH range of colour change (3.8 to 5.4) for this dye. Our methodology was tested by employing a commercial pectinase product as the sucrose of pectinesterases. Statistical analysis using the Student's t-test showed good agreement between the reference titrimetric method and that reported herein. AA

FOOD MICROBIOLOGY AND HYGIENE

16

Sharpe (AN). **Rapid tests for food microbiological quality.** *Food Australia* 45(3): 1993; 129-134

New methods which provide better performance in the quality control of food are described in this article. Techniques covered are direct epiflourescent filter technique (DEFT), direct INT staining, catalase test, adenosinetriphosphate detn. using bioliminescence, procedures using genetically engineered luminescent organism, electrical impedence or conductance measurement, metabolic measurement, hydrophobic grid membrane filter, *Escherichiu coli* 0157, opti-MuGcoliform/*E. coli* count, *Salmonella* spp. detection, DNA probes, polymerase chain reaction, monoclonal antibodies and identification kits and system. SRA

17

Teuber (M). **Genetic engineering techniques in food microbiology and enzymology.** *Food Reviews International* 9(3); 1993; 389-409

This review describes the clear-cut technology of fermentation-produced chymosin (1) and genetically modified baker's yeast and some other microorganisms (2) the basic concepts of risk assessment, regulation and labeling are outlined and contrasted with the facts of risk perception, amplification, and even stigmatization of genetically modified foods by the general public (3) if the discrepancy between risk perception by the experts and lay people cannot be solved. The new technique will have no chance. 60 references. SRA

18

Buescher (RW) and Burgin (C). **Diffusion plate assay for measurement of polygalacturonase activities in pickle brines.** *Journal of Food Biochemistry* 16(1); 1992; 59-68

A modified diffusion plate assay was evaluated for its efficiacy in measuring polygalaturonase (PG) activities in simulated and commercial cucumber pickle brines. The diffusion plate assay was capable of detecting low PG activities (7×10^{-5} PG units/mL. Clear zone diameters formed in the diffusion plate assay were highly correlated to changes in specific viscosity obtained by the conventional viscometry assay procedure. Slight, dark-stained zones appeared with an ionic strength of 1.6 (NaCl) and increased in diameter with increasing ionic strength. Ionic strengths of commercial pickle brines (0.9 - 1.8) did not interfere with the diffusion plate assay for detecting PG activity. The diffusion plate assay was observed to be a suitable and convenient alternative to the viscometry procedure for monitoring PG activities in brines used for the bulk storage of pickles. AA

Enzymes

19

Quax (WJ). **Thermostable glucose isomerases.** *Trends in Food Science and Technology* 4(2); 1993; 31-34

Reviews the use of glucose isomerase in the production of high fructose corn syrups which is an economical substitute for sucrose. The production of thermostable enzymes with improved heat stability using the protein engineering and screening techniques of thermophilic microorganisms, has also been described. 26 references. GS

20

Habulin (M) and Knez (Z). **Influence of reaction parameters on synthesis of n-butyl oleate by immobilized *Mucor miehei* lipase.** *FAT Science Technology* 95(7); 1993; 249-252

Enzymes lower the activation energy for reaction. Activation energy can be properly determined from Arrhenius plot, however the temp. range is quite limited. At temp., higher than the usual biological range, thermal deactivation occurs. In this paper some thermodynamic properties of immobilized *Mucor miehei* lipase activity, which catalyses the synthesis of n-butyl oleate are presented. Esterification was performed batch-wise in a stirred tank reactor with equimolar substrate ratio. Very low activation energy was determined (9.561 kJ.mol). At temp. higher than 80°C rapid thermal degradation occurred. The content of this process was found to be 0.898 and enthalpy was 25.877 kJ/mol. AA

Fermented foods

21

Vaidehi (MP). **'Tempe' - a biotechnological boon for nutritionally rich foods.** *Beverage and Food World* 20(4); 1993; 35-36

'Tempe' is the highly nutritive fermented food popular in Indonesia. Soybean *tempe*, soybean *tempe* with hulls, soybean + sesame *tempe*, sunflower + sesame *tempe*, peanut press cake *tempe*, rice bran + sesame *tempe*, carrot grating + greengram + sesame *tempe*, cookies, chillie biscuits, and dried chapathies are some of the enriched products with 20% *tempe* used in Indonesia. SRA

Bacteria

22

Whiting (RC) and Cygnarowiez-Provost (M). **A quantitative model for bacterial growth and decline.** *Food Microbiology* 9(4); 1992; 269-277

This model accurately describes the shape of microbial growth curves. Its 4 parameters model different portions of the curve and permit quantitative comparisons of different growth conditions. Changes in the parameters may be described by multiple regression equations. The parameter changes could also be described by other relationships such as the Arrhenius or square root functions for different temp. The assumptions in this model invite experimental verification and subsequent modifications. SRA

23

Marth (EH). **Growth and survival of *Listeria monocytogenes*, *Salmonella* species, and *Staphylococcus aureus* in the presence of sodium chloride: A review.** *Dairy, Food and Environmental Sanitation* 13(1); 1993; 14, 16-18

Review article. 41 references. SRA

24

Okiyama (A), Shirae (H), Kano (H) and Yamanaka (S). **Bacterial cellulose. I. Two-stage fermentation process for cellulose production by *Acetobacter aceti*.** *Food Hydrocolloids* 6(5); 1992; 471-477

25

Okiyama (A), Motoki (M) and Yamanaka (S). **Bacterial cellulose. II. Processing of the gelatinous cellulose for food materials.** *Food Hydrocolloids* 6(5); 1992; 479-487

26

Gatto (E), Peddie (F) and Andrews (S). **Acidification power: Performance evaluation of freeze-dried lactic acid bacteria.** *Food Australia* 45(3); 1993; 124-128

Studies of different samples of wet yeast demonstrated a positive correlation between acidification power (AP) values and fermentation performance. It is established that dried yeast cultures can also be evaluated by this method. A modified AP test is described which can be applied to freeze-dried lactic-acid bacteria. The test is simple, rapid and highly reproducible. It can be applied to fresh or freeze-dried starters that generate acid end products by the fermentation of sugars. This research has provided a strong foundation for introducing the AP test as a routine quality control procedure to the dairy industry. SRA

27

Kim (WJ). **Bacteriocins of lactic acid bacteria: their potentials as food biopreservative.** *Food Reviews International* 9(2); 1993; 299-313

This review discusses the research that has been conducted on bateriocinogenic lactic acid bacteria (LAB) - isolated from a wide var. of foods and in some instances of animal origin - and the characteristics of bacteriocins. Special emphasis is placed on their potentials for use as food preservative and on their physicochemical nature, antibacterial spectrum, and genetic behaviour. LAB covered are Pediococci, Lactobacilli (*Lactobacillus acidophilus*, *Lact. plantarum* and *Lact. sake*), Carnobacterium, Leuconostocs. Bacteriocins covered are nisin, diplococcin, lactostrepcin and lactococcin. 132 references. SRA

28

Samoon (AH). **Role of bacteria in spoilage and fermentation of beverages and foods.** *Beverage and Food World* 20(2); 1993; 15, 16, 18

Various group of bacteria (*Pseudomonadaceae*, *Enterobacteriaceae*, *Vibrionaceae*, *Micrococcaceae*, *Streptococcaceae*, *Bacilaceae*, *Lactobacillaceae*, *Propionibacteriaceae*, *Streptomycetaceae*) prevalent in food substances and surrounding environment that play a vital role in spoilage and fermentation under commercial conditions are classified. The morphological and related characteristics of important groups of bacteria associated with foods and beverage are discussed in brief. The relative importance of these bacteria in food microbiology is highlighted. SRA

Yeasts

29

Fatimah Abu Bakar, Ariff (A) and Fadzilla Abu Bakar. **Growth kinetics study of bakers' yeast (*Saccharomyces cerevisiae*).** *ASEAN Food Journal* 7(4); 1992; 205-206

The productivities of yeast cells in batch and exponential fed-batch culture systems, and the max. production of cells using sugar from tapioca flour and commercial glucose as substrates are compared in this study. Results indicated that both substrates produced high concn. of ethanol during batch fermentation resulting in low productivity of cells. Glucose from tapioca flour gave a productivity of 0.42 g/l/h, and commercial glucose of 0.461 g/l/h. Use of an exponential fed-batch system gave max. volumetric productivity of cell mass while maximizing the cell yield, compared to the conventional batch process. SRA

BIOTECHNOLOGY

30

Kok (EJ), Reynaerts (A) and Kuiper (HA). **Novel food products from genetically modified plants: Do they need additional food safety regulations?.** *Trends in Food Science and Technology* 4(2); 1993; 42-48

The need for additional food safety regulations for genetically modified plant products (tomatoes with extended shelf-life, insect resistant tomatoes); research strategies that have been used in the risk evaluation of genetically modified products; insight into the basic immunological processes are reviewed. 22 references. GS

31

Kanawjia (SK), Jha (A) and Singh (S). **Biotechnological developments of flavour and colour in food processing.** *Beverage and Food World* 20(4); 1993; 30-32

Aspects discussed in this article are flavour and fragrance chemicals (methyl ketones, diacetyl, lactones, butyric acid, isovaleric acid, terpenes, sequiterpenoids), complex flavour and aroma products (dairy flavours, bread flavours, mushroom flavours), production of flavour chemicals by plant tissue culture, evaluation of products and colourings. SRA

TISSUE CULTURE

Nil

FOOD ADDITIVES

Colourants

32

Collins (TFX), Black (TN), O'Donnell (MWJr), Shackelford (ME) and Bulhack (P).

Teratogenic potential of FD and C Red No. 3 when given in drinking water. *Food and Chemical Toxicology* 31(3); 1993; 161-167

FD and C Red No. 3 (Erythrosine), a common food additive was administered (0.05, 0.1, 0.2 or 0.4% dosing sol. in distilled water and corresponding daily doses of 64, 121, 248 and 472 mg FD and C Red No. 3/kg body wt.) to pregnant Osborn-Mendel rats to study its teratogenic potential. No dose-related teratogenesis was seen. FD and C Red No. 3 was neither foetotoxic nor teratogenic at the dose levels tested in drinking water. BV

CEREALS

33

Jood (S) and Kapoor (AC). **Protein and uric acid contents of cereal grains as affected by insect infestation.** *Food Chemistry* 46(2); 1993; 143-146

Wheat, maize and sorghum with 25, 50 and 75% infestation caused by *Trogoderma granarium* Everts and *Rhizopertha dominica* Fabricus separately and in mixed population were analysed at 1, 2 and 4 months of storage. Results indicated substantial reductions in protein nitrogen and true protein contents in 3 cereal grains at 75% level infestation, but the reductions was non-significant at 25 and 50% levels of grain infestation. Variations in nitrogenous compounds during storage of 1, 2 and 4 months were marginal. Both insect sp. produced uric acid above acceptable limits (10 mg/100 g) even at 50% infestation levels of 3 cereal grains. SD

34

Morrison (WR), Law (RV) and Snape (CE). **Evidence for inclusion complexes of lipids with V-amylose in maize, rice and oat starches.** *Journal of Cereal Science* 18(2); 1993; 107-109

Non waxy maize, rice and oat starches contained amylose-lipid inclusion complexes. In barley starches a fraction of the amylose is fully saturated with lipid while the rest is lipid free. Lipids in non-waxy cereal starches contained over 60% *cis*-unsaturated fatty acids and when isolated, they were viscous liquids at ambient temp. GS

Barley

35

Macri (LJ), Mac Gregor (AW), Schroeder (SW) and Bazin (SL). **Detection of limit dextrinase inhibition in barley.** *Journal of Cereal Science* 18(2); 1993; 103-106

Two proteins have been isolated from barley (*Hordeum vulgare* cv. Harrington) that inhibit limit dextrinase from germinated barley. These inhibitors were purified by carboxymethyl cellulose ion exchange chromatography and chromatofocusing. They were shown to have approx. $M_{r/s}$ of 15k and isoelectric points of approx. 6.7 and 7.2 (measured by isoelectric focusing). AA

Oats

36

Guth (H) and Grosch (W). **Odourants of extrusion products of oat-meal. Changes during storage.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(3); 1993; 22-28

Aroma extract dilution analysis of a fresh extrusion product (EP) of oat meal showed 25 odorants of which hexanal (I) octanal, *trans*-2-3- epoxyoctanal, (II) (E,E)-2, 4-nonadienal, (III) (E,E)-2,4-decadienal, (IV) *trans*-4,5-epoxy-(E)-2-decenal, (V) 4-hydroxy-2-nonenoic acid lactone (VI) and vanillin (VII) appeared with high FD factors. Compounds I to IV and caproic acid (VIII), which increased during storage of EP, were quantified by an isotope dilution assay. Soaking the EP in water liberated expecially VII from starch inclusion complexes; its concn (mg/kg) which was determined after methylene chloride extraction increased from 0.09 to 6.7. During storage of EP in closed bags at 22°C the levels (mg/kg) of I and VIII increased, causing a rancid off-flavour: 0 d, 0.51, 1.9 VIII; 35 d, 1.2 I, 10.4 VIII; 9.6 I, 11.3 VIII. AA

37

Autio (K), Malkki (Y) and Virtanen (T). **Effects of processing on the microstructure of oat (*Avena sativa*) bran concentrate and the physicochemical properties of isolated β-glucans.** *Food Structure* 11(1); 1992; 47-54

Microstructure of oat cell walls during concn. of oat bran and isolation of β-glucans was studied using fluorescence microscopy. Oat bran concentrate from cv. Nasta had higher β-glucan content and viscosity of crude extract than from the commercial bran mixture. Nasta bran conc. contained intact aleurone and subaleurone layers while the commercial bran concentrate large portions of endosperm cell walls. The commercial bran mixture contained β-glucan degrading enzymes which survived the entire isolation procedure but was effectively inactivated heating at 78°C with 80% ethanol. The solubility and recovery of β-glucan improved in the presence of enzymes in the extraction step and viscosity decreased when measured at the same β-glucan concn. SD

Rice

38

Amanatullah (AZ), Dawlatana (M), Nurannabi (BI) and Bhuiyan (MZH). **Studies on expansion and swelling qualities of rice.** *Bangaldesh Journal of Scientific and Industrial Research* 27(3/4); 1992; 1-8

Three var. of paddy (BR_4, BR_5 and BR_6) were parboiled according to the traditional method. The cooking time, expansion and swelling ratios of raw and parboiled samples of 3 var. of rice were analysed. Parboiled rice required more cooking time than raw rice to attain softness and BR_5 var. needed the least cooking time. Parboiling decreased the length and increased the breadth of the grain. The expansion and swelling ratios of raw rice was higher than that of parboiled rice, in all the samples. GS

39

Eggum (BO), Juliano (BO), Perez (CM) and Acedo (EF). **The resistant starch, undigestible energy and undigestible protein contents of raw and cooked milled rice.** *Journal of Cereal Science* 18(2); 1993; 159-170

The *in vitro* and *in vivo* resistant-starch (measured in growing rats) levels were low in five raw rice cvs different in apparent amylose content, and the values were correlated positively with amylose content. Cooked and cooked parboiled rices generally had higher resistant-starch contents than raw rices, particularly those with intermediate gelatinization temp. starches, but waxy rice had very low values. Values for undigestible energy, which is mainly in the form of unfermented energy and undigestible protein, were similar in raw rices, but increased with processing, particularly in the higher-amylose rices. *In vivo* resistant starch was not correlated significantly with undigestible energy and undigestible protein, but undigestible energy and protein were correlated with each other. Parboiling was calculated to increase the resistant-starch content of cooked rice by not more than 1%. Thus, cv differences in cooked-starch digestibility were reflected less in levels of resistant starch than in the rate of starch digestion as indicated by glycaemic and insulin response. AA

Rye

40

Javabainen (P) and Linko (Y-Y). **Factors affecting rye sour dough fermentation with mixed-culture preferment of lactic and propionic acid bacteria.** *Journal of Cereal Science* 18(2); 1993; 171-185

Results of the study show that the dough yield and temp. were the most dominating factors affecting the second-degree polynomial models to describe dependent output variables during rye dough acidification. For rye sour dough fermentation a dough yield of 320%, temp. of 35°C and amount of pre-ferment of 32% (rye flour wt. basis) gave the highest propionic acid concn. of 0.55 g/100 g sour dough with the pre-ferment of *L. brevis* together with *P. acidi* propionici. Titratable acidity values of about 27 to 35 ml 0.1 M NaOH/5g flour, indicative of medium to strong sour rye dough were obtained and the lactic to acetic acid molar

ratio of 1.9 to 4.0 were within the optimal range. A pH < 4 and a typical titratable acidity of about 16 (ml 0.1 M NaOH/5 g flour) of fermented sour were obtained usually in 17 to 24 h with both bacteria combinations used in the pre-ferment. The mixed culture pre-ferment of lactic and propionic acid bacteria thus appeared to be a potential alternative along with traditional starters used in rye sour dough fermentation, with an improved mould-free bread shelf-life through an increased propionate level generated *in situ*. GS

Wheat

41

Patel (KP), Valand (VM) and Patel (SN). **Powder of neem-seed kernel for control of lesser grainborer (*Rhizopertha dominica*) in wheat (*Triticum aestivum*).** *Indian Journal of Agricultural Sciences* 63(11); 1993; 754-755

1 day old *R. dominica* were released in wheat mixed with neem-kernel powder at 1, 2, 3, 4 and 5% levels. Emergence of adult and grain damage were recorded at 32, 64 and 96 days. Insect population increased significantly with passage of time but the adult population was min. in seeds treated with 5% neem kernel powder and the insect population increase was 13.46, 30.69 and 58.67 (retransformed values) after 32, 64 and 96 days respectively. The seed damage at 5% level was 15.49% after 96 days whereas it was 29.81% in control. KAR

42

Gruppen (H), Kormelink (FJM) and Voragen (AGJ). **Water-unextractable cell wall material from wheat flour. 3. A structural model for arabinoxylans.** *Journal of Cereal Science* 18(2); 1993; 111-128

Water-unextractable wheat flour arabinoxylans were degraded with purified endo (1-4)-β-D-xylanases and a (1-4)-β-D-arabinoxylan arabinofuranohydrolase from *Aspergillus awamori* in order to elucidate their structural features. The arabinoxylan fragments obtained were characterized and quantified using Bio-Gel P-2 chromatography in combination with high-performance anion-exchange chromatography. A model is proposed, based on the results obtained, in which arabinoxylans are envisaged as containing highly-branched regions, mostly consisting of tetrameric repeating units of an unsubstituted and a double arabinofuranosylated xylose residue interlinked with less-branched regions, which include subregions containing up to 7 contiguous unsubstituted xylose residues. The highly-branched regions are enriched in both O-2,3 disubstituted, as well as O-2 monosubstituted, xylose residues. The latter are absent in the less-branched regions. Variation in arabinose/xylose ratio between different arabinoxylan populations is due to variation in the relative proportion, as well as the composition, of the less-branched regions. In general, water-unextractable arabinoxylans are degraded by the purified xylanases to a lesser extent than water-extractable arabinoxylans with similar arabinose/xylose ratios and glycosidic linkage compositions. AA

43

Gruppen (H), Kormelink (FJM) and Voragen (AGJ). **Enzymic degradation of water-unextractable cell wall material and arabinoxylans from wheat flour.** *Journal of Cereal Science* 18(2); 1993; 129-143

mifferences were investigated in the enzymic breakdown of water-unextractable cell wall material (WUS) of wheat flour by endoxylanase I (endol) and endoxylanase III (endol III) purified from *Aspergillus awamori*. The degradation by these enzymes of water-extracted and alkali-extracted arabionxylans was also examined. Both enzymes released in total 90% of the arabinoxylans present in the WUS, without solubilization of glucomanns, (1-3, 1-4)-β-glucans and cellulose. Both poly- and oligo saccharides were released during the incubation. Arabinoxylans with similar arabinose/xylose ratios, obtained from different fraction of the WUS, showed different degrees of degradation. No differences could be observed in enzymic solubilization and degradation between WUS and alkali-extracted arabinoxylans from different wheat cvs. Compared with endol, incubation with endoIII resulted in a more rapid solubilization and/or degradation of WUS and extracted arabinoxylans. EndoIII digestion resulted also in a more rapid decrease in the total

water-holding capacity of the residual WUS, although, when the water-holding capacity was expressed on a per gram of residual WUS basis, a two-fold increase was observed as a result of enzyme incubation. Application of endoIII in baking trials yielded a 14% increase in loaf vol., together with an improvement in crumb structure and 'break and shred', whereas endol yielded only a 4% increase of loaf vol. with no improvement of other baking characteristics. AA

44

Rouau (X). **Investigations into the effects of an enzyme preparation for baking on wheat flour dough preparation.** *Journal of Cereal Science* 18(2): 1993; 145-157

The modification of pentosans in doughs by fungal enzyme Grindamyl S 100, used as flour improver, is reported. In the absence of added enzyme 15-20% of water-unextractable anhydro-arabinose plus anhydro-xylose (ara + xyl) were solubilized during dough processing, depending on the starting flour used. At the optimal dosage, the enzyme preparation broughtout a further (ara + xyl) solubilization of 9-29%. The liberation of arabinoxylans modified the viscosity of water extracts from the doughs. The specific viscosities of extracts from enzyme-treated doughs were much enhanced (approx. 40-65%) as compared to the control, because the av. apparent intrinsic viscosity of extracted arabinoxylans (both water extractable and enzyme-released) remained high. GS

45

Confronti (FD), Johnson (JM) and Alley (M). **The effects of nitrogen fertilization and chlorination on the protein and fatty acid contents of soft red winter wheat flour, and their influence on the baking quality for angel food cake.** *Journal of Cereal Science* 18(2): 1993; 187-195

Soft red winter wheat (Coker 916) was subjected to varying N-fertilization levels and portions of the milled product were chlorinated. Increased application levels of N-fertilization had a significant effect ($P < 0.05$) on protein and unsaturated fatty acid (18:1, 18:2; 18:3) content. Use of chlorinated flour improved the physical characteristics of the angel food cake. A change in the ratio of uneven-to even cake cells produced a rounder and closer packed crumb matrix, which also contributed to a lower vol. cake. The improvement in the crumb texture and increase in cell evenness was correlated negatively ($r = -0.84$) with a decrease in linolenic acid content after chlorination. Chlorination of flour caused increase in cake hardness. Baking quality of chlorinated soft wheat flour improved with the combined effect of protein and fatty acid content. GS

Wheat flour

46

Timmermann (F), Voudouris-Tsoukala (M) and Belitz (H-D). **Aseptic proteinases in wheat flour. I. Characterization.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1): 1993; 5-11 (De)

Different proteolytic activities were determined in rye flour and in several wheat flours in relation to the wheat var. and the substrates used (azocasein, protamine sulphate, haemoglobin and benzoyl arginine nitroanilide). Endopeptidases with activity against azocasein exhibited a pH optimum of 5.0 and a temp. optimum of 58°C. They were completely inhibited by pepstatin, whereas EDTA showed only a minor inhibitory effect. Bivalent cations activated the enzymes slightly. The activity of the enzymes was also inhibited by pepstatin using the substrates haemoglobin. B-chain insulin and glucagon. The data obtained show that the enzymes belong to the aspartic proteinases. AA

47

Timmermann (F) and Belitz (H-D). **Aspartic proteinases in wheat flour. II. Enrichment.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196 (1): 1993; 12-16 (De)

Proteinases in wheat flour, which are active against azocasein at pH 5.0 and inhibited by pepstatin, were enriched by precipitation with ammonium sulphate, affinity chromatography on haemoglobin Sepharose 4B and ion exchange chromatography on carboxymethylallulose. The crude enzyme preparation delivered 11 active fractions on

carrier-free isoelectric focusing in the pH range 4.76-5.66. The two main peaks exhibited isolectric points of 5.05 and 5.24 respectively, and were free of exoproteolytic activities. The amino acid compositions of the active fractions were similar and characterized by about 50 mol% of Glu, Gly and Ser. AA

48

Timmermann (F) and Belitz (H-D). **Aspartic proteinases in wheat flour. III. Effect on dough and gluten.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1); 1993; 17-21 (De)

Only 25% of the aspartic proteinases of wheat flour are extractable with water. Therefore the main part of these enzymes remains in the gluten during washingout of dough. For characterizing the effect of the aspartic proteinases on gluten proteins, a homogenate of gluten in dilute acetic acid was incubated at pH 3.0. After incubation for different times the gluten suspension was separated into soluble and insoluble fractions by the addition of NaCl. Load extension tests of the control showed that the viscoelastic properties of the NaCl-insoluble fraction corresponded to the starting material. With increasing incubation time a decrease in max. resistance and an increase in extensibility was observed. Incubation in the presence of pepstatin caused only minor changes. Therefore exopeptidases are without effect. An influence of gluten deamination can also be excluded. The same effects (decrease of max. resistance, increase in extensibility) were observed with dough and could be stopped also by addition of pepstatin. The amount of the NaCl-soluble fraction of gluten increased during incubation of gluten without pepstatin. Its amino acid composition changed with incubation time from an albumin-like to a glutenin-like pattern. AA

MILLETS

Corn

49

Vickers (Z) and Roberts (A). **Liking of popcorn containing different levels of salt.** *Journal of Sensory Studies* 8(2); 1993; 83-99

Low, medium and high salt level unflavoured samples were evaluated by 300 panelists for overall liking, salt intensity and salt liking in repeat sessions. Liking score decreased after eating a 3-cup serving. Sensory specific satiety for different salt levels was not found. Consuming low salt popcorn increased the saltiness rating while consuming high salt popcorn decreased the same. When the panelists retasted the samples at least one day later overall liking for high salt sample increased but the increase was less than that for medium and low salt samples. Questionnaire measurements of popcorn liking and frequency of consumption (time 1, during 3 cup serving) were poorly related to measurements of liking or changes in liking obtained in repeat evaluations (time 2, immediately after time 1, and time 3, 1 day or 7 days later than time 1). SD

50

Winkelmann (DL) and Listman (GM). **Corn in the developing world and the international maize and wheat improvement center.** *Food Reviews International* 9(2); 1993; 315-349

Review. 5 references. SRA

PULSES

51

de Lumen (BO). **Molecular strategies to improve protein quality and reduce flatulence in legumes: A review.** *Food Structure* 11(1); 1992; 33-46

Molecular approaches to improving protein quality and reducing flatulence in beans are reviewed. The regulation of seed-specific expression and organisation of seed storage protein genes are known. Similar techniques designed to increase the methionine content of tobacco seeds using hetrologus seed protein genes from peas, common bean and soybean, could be adopted to modify lysine, tryptophan and threonine in cereals and legumes. Through the study of molecular biology of carbohydrate and lipid metabolism in the developing seed it may be possible to improve the digestibility of proteins and starch, alter

fatty acid composition and minimize formation of undesirable flavours. Similarly by the application of suitable genetic engineering it may be possible to improve the usefulness of legumes and other plant seeds as food sources with no adverse effect on seed biology. 147 references. SD

52

Chander (H) and Berry (SK). **Control of insect infestation in *Wadian* (traditional savoury preparation) by sorbic acid.** *Beverage and Food World* 20(2); 1993; 28-29

Sorbic acid at 1 and 2% concn. (W/W) in mung and urd Wadian was evaluated for checking infestation by *Rhyzopertha dominica* (F) and *Stegobium paniceum* (L.) during storage. Percent adult mortality of both the insects in treated wadian samples did not differ much from their respective untreated control at both the storage intervals. Sorbic acid mixed at 1% concn. could supress the progeny of *R. dominica* by 88.9 and 83.6% and that of *S. paniceum* by 90.0 and 93.3% in mung and urd wadian respectively even after 3 months' storage. Sorbic acid incorporation even at 2% concn. was found not to affect the taste of the cooked wadian to any perceptible extent and the treated wadian retained their natural colour. AA

Beans

53

Bressani (R). **Grain quality of common beans.** *Food Reviews International* 9(2); 1993; 237-297

This review discusses the importance of arriving at grain quality characteristics in food grain legumes, an activity which requires the participation of breeders, agronomists, food scientists and nutritionists. Other aspects covered are components of grain quality of common beans, effect of processing (moist cooking, dry-thermic processing, germination, fermentation, dehulling and milling, irradiation), acceptability characteristics (physical aspects of grain, factors related to post-harvest biochemistry, handling, and storage), nutritional factors (positive attributes, negative attributes: antinutritional factors, nutrient bioavailability), food products (preparation of bean ingredients and utilization in food products). 40 references. SRA

Cowpeas

54

McWatters (KH), Resurreccion (AVA), Fletcher (SM), Peisher (AV) and Andress (EL). **Physical and sensory characteristics of akara (fried cowpea paste) made from whole and decorticated cowpeas (*Vigna unguiculata*).** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 157-161

The preparation of akara, a popular West African food made from whipped cowpea paste, traditionally involves decortication (seed coat removal). Decortication may not be necessary for consumers who are unfamilar with product characteristics. Akara was prepared from meal processed from whole or decorticated seeds. Paste from whole seeds was more viscous and dense than decorticated and produced fewer balls per batch. Akara from whole seeds required significantly more force to shear-compress and had a darker, duller colour than akara from decorticated seeds. Akara from both processes contained 22% protein, which was more than twice that of fried cornmeal hush puppies and French fried potatoes. Sensory quality was evaluated by 128 Georgia teenagers. Appearance and colour ratings were significantly higher for the decorticated product, there was no difference in flavour, mouthfeel or overall quality ratings due to decortication. AA

Kidney beans

55

Coffey (DG), Uebersax (MA), Hosefield (GL) and Bennink (MR). **Stability of red kidney bean lectin.** *Journal of Food Biochemistry* 16(1); 1992; 43-57

Lectins are toxic heat-stable glycoproteins, termed phytohemagglutinins, that depress the nutritional quality of *Phaseolus vulgaris*. Purified phytohemagglutinin (PHA-P) was separated from dark red kidney beans (Montcalm cv) by affinity chromatography and subjected to various treatments including:

thermal (70-100°C; chemical (2 M NaCl, 5 M urea, 5% mercaptoethanol, pH 12 and pH 3) and enzymatic (peptidases, proteases and carbohydrases). At 70°C, the PHA-P activity decreased with a linear response. Exposure to pH 12 or 5 M urea were the most effective chemical treatments for reducing hemagglutinating activity. Treatment with proteases resulted in 88-98% reductions in PHA-P activity. Mannosidase treatment resulted in a slight but significant ($P < 0.01$) reduction in activity; however, amylases and neuraminidase had no effect on activity. Terminal sialic acid residues may not be an important determinant of PHA-P activity. AA

Leucaena leucocephala

56

Sethi (P) and Kulkarni (PR). **In vitro protein digestibility of *Leucaena leucocephala* seed kernels and protein isolate.** *Food Chemistry* 46(2); 1993; 159-162

Autoclaving appreciably improved the *in vitro* digestibility of *Leucaena* seed kernel meal. Digestibility of *Leucaena* protein isolate increased compared to raw seed kernels due to the removal of antinutritional factors, particularly immunosine in the non-precipitable supernatant (whey) fraction. SD

Navy beans

57

Redden (RJ),Isaacs (AR), Varley (H), Greaves (F) and Lee (S). **Canning quality of navy beans varieties.** *Food Australia* 45(1); 1993; 73-79

This paper describes genetic variation for canning quality and the development of criteria to assess canning quality in new breeding lines. Field trails were conducted over 8 yrs from 1983-1991. Canning quality was assessed on selected navy bean cvs grown in regional trials each yr, at both irrigated and rainfed locations until 1985. In 1988 a comprehensive evaluation was established to conduct canning tests in preliminary advanced and regional trails, from both irrigated and rainfed growing conditions. A two-stage selection program with 6 yrs per cycle and canning tests over the last three, produced good quality selections from mediocre original parents, indicating the success of a simplified subjective test for canning quality. SRA

OILSEEDS AND NUTS

Coconuts

58

Hurtada (WA) and Raymundo (LC). **Storage stability of dehydrated young coconut kernel ("Buko").** *ASEAN Food Journal* 7(4); 1992; 189-195

The effectiveness of sulphiting, antioxidant and packaging (double laminate bags or Al pouch) material in prolonging the shelf-life of dehydrated buko kernel was evaluated. Dried kernel from 7-8 month old coconut was dehydrated after sulphiting and treatment with vitamin E, packed and stored for 6 months under ambient conditions. The study showed that vitamin E treated dehydrated 'buko' strips packaged in Al pouches at room temp. was the best product and remained stable for 6 months. SRA

Groundnuts

59

Abdullah (A), Resurreccion (AVA) and Beuchat (LR). **Formulation and evaluation of a peanut milk based whipped topping using response surface methodology.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 162-166

Using a rotatable design for two factors, 13 formulations of whipped topping were prepared containing 40% peanut milk as a source of protein. Whipped toppings were subjected to sensory evaluation using descriptive analysis. Colour, overrun, viscosity and syneresis were analysed. Peanut-based whipped toppings were generally white and glossy with slightly stiff foam and fine, uniform air cells. There were significant differences in foam stiffness, uniformity of size of air cells and sweetness of various topping formulations. The physicochemical characteristics of formulated

peanut-based whipped toppings were similar to those of commercialiy available whipped toppings. AA

60
Nigam (SN Ed). **Groundnut - a global perspective. Proceedings of an international workshop. 25-29 Nov 1991, Andhra Pradesh.** 539; 1992

Major papers presented at the proceedings are on production and trade of groundnuts, regional reviews, donor reports, special topics including information transfer, processing and products, integrated post management, genetic sources - including wild species, biotechnology and crop modeling. Nearly 100 poster abstracts are included. These cover general topics, genetic resources, biotechnology, breeding, crop physiology and nutrition, diseases and insect pests, intercropping and weed management processing and products. The proceedings provide a comprehensive record of progress made in groundnut research and production technology in the 1980's. The workshop recommendations, originating from disciplinary group discussions, outline the future research requirements of the crop. CSA

Nutmeg

61
McKee (LH), Thompson (LD) and Harden (ML). **Effect of three grinding methods on some properties of nutmeg.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 121-125

The particle size, composition and antioxidant capacity of nutmeg ground by ambient, chilled and liquid nitrogen methods were studied. About 70% of nutmeg ground by each of the 3 methods was classified as 'medium' particle size. Grinding method did not affect moisture content, which averaged 6.8%. Nutmeg ground by the ambient method had a higher percentage of steam volatile oil (5.8%) than nutmeg ground by the chilled (5.5%) and liquid N (5.3%) methods. The % of oleoresin in nutmeg ground under ambient conditions varied widely from batch to batch, while nutmeg ground by the liquid N method had a more consistent batch-to-batch % of oleoresin. A series of standard solutions was prepared from pure nutmeg oleoresin and a colour equivalent was calculated for each sample to indicate the amount of colour compound in the sample relative to the standard curve. The colour equivalent of nutmeg ground by the liquid nitrogen method (0.969 g/100 mL) was higher than that for nutmeg ground by the chilled (0.748 g/100 ml) and ambient (0.902 g/100 mL) methods. The addition of 2.5% nutmeg was found to have a slight antioxidant effect when tested in a model salad dressing formula. AA

Soybeans

Soy products

62
Hung (TV), Jiang (HH), Drew (PG) and Black (RG). **Characterisation of yeasts and bacteria in lupin-soy-sauce fermentation.** *ASEAN Food Journal* 8(3); 1993; 99-104

A soy sauce supplemented with lupin flour or flakes (30%) was prepared using *Aspergillus oryzae* and microorganisms derived from a raw soy sauce originating from China. The microorganisms growing in the lupin-soy sauce 2nd stage fermentation were isolated and characterized as a system consisting of *Pediococcus acidilactici*, *Bacillus licheniformis*, *B. subtilis*, *Micrococcus* spp. and *Torulopsis*. SRA

Soy flour

63
Yadav (R), Mital (BK) and Jha (YK). **Biochemical changes in defatted soy flour during storage.** *Beverage and Food World* 20(4); 1993; 11-12, 15

Commercially available defatted soy flour (DSF) samples were packed in polyethylene bags and stored in desiccators at 22 and 37°C under 57 plus or minus 2 and 80 plus or minus 1% RH for 90 days. The samples were drawn at 15 days intervals and analysed for different characteristics. DSF samples exhibited more pronounced decrease in protein, pH and increase in acidity at 80% RH and 37°C than

at 57% RH and 22°C over 90 days storage. NPN content markedly increased up to 30 days under all storage condition but showed a declining trend at 22°C. At 57% RH under both storage temp. the total counts, proteolytic counts, yeast and molds increased in number upto 30 days and thereafter declined. Coliforms were not detected after 45 days. Microbial counts increased at 80% RH at both temp. throughout the storage. SRA

TUBERS AND VEGETABLES

Onions

64
Randle (WM) and Bussard (ML). **Streamlining onion pungency analyses.** *Hortscience* 28(1); 1993; 60

A method is reported for evaluating onion pungency that reduces time and cost. This new method decreased the time required to process a single bulb from 78 (standard method) to 19 min. and thereby increased the likelihood that chemical analysis can be used in onion breeding programs when selecting for pungency. SRA

Sweet potatoes

65
Walter (WMJr) and Schwartz (SJ). **Controlled heat processing of jewel sweet potatoes for puree production.** *Journal of Food Quality* 16(2); 1993; 71-80

'Jewel' sweet-potato slices 0.5 cm thick were precooked at 100, 125 and 150°C for varying periods of time, and finish cooked for 15 min at 150°C and pureed. Puree from 100°C, 6 min precook treatment was similar to puree from baked sweet potatoes (1.25 h at 195°C) in chemical and physical characteristics. Sensory panel clearly distinguished the two purees but were divided in respect of preference. Heat processed puree showed higher maltose, lower starch content while baked control puree showed decrease starch mol. size and viscosity, having been more completely hydrolysed. SD

Vegetables

66
Seow (CC), Ng (KB) and Bourne (MC). **Effect of blanching treatments on physico-chemical properties of dehydrated carrots, celery and green beans.** *ASEAN Food Journal* 7(4); 1992; 184-188

This study indicated that higher rates of dehydration and rehydration, greater rehydration ratios, and firmer texture of the rehydrated products were obtained with low temp. long time/high temp. short time - blanched materials than with materials blanched using the conventional single stage high temp. short time method. SRA

67
Shinohara (K). **Desmutagenicity of vegetables and fruits.** *JARQ (Japan Agricultural Research Quarterly)* 26(1); 1992; 62-66

Aqueous dialyzates from various kinds of vegetables and fruits such as spinach, broccoli, egg-plant and apple inhibited the mutagenicity of Trp-P-2 toward *Salmonella typhimurium* TA 100 and TA 98, and the desmutagenicity was retained even after heating at 100°C for 20 min. Dialyzates of burdock, eggplant, spinach and apple also inhibited the mutagenicity of Trp-Ps, benzo-[a]-pyrene, sterigmatocystin, aflatoxin B1, 2-(2-furyl)-3-(5-nitro-2-furyl)acrylamide and N-methyl-N'-nitro-N-nitrosoguanidine. It was suggested that desmutagenic principles of apple and spinach be polymerized polyphenol fractions and relatively high mol. wt. components, respectively. AA

Leafy vegetables

68
Chauhan (SK) and Sharma (RC). **Development of instant dehydrated saag.** *Beverage and Food World* 20(4); 1993; 25-26

Instant dehydrated *saag* was prepared from blends of mustard (*Brassica compestris*), spinach (*Spinacia oleraceae*), fenugreek (*Trigonella focnumgraccum*) and turnip

(Brassica rapa) with onion, garlic, ginger, cardamom, Cinnamon, red chillies, turmeric, jaggery and maize flour. Fully cooked material along with spices, salt was homogenised and dried (moisture 10%) and packed were stored at room temp. for 12 months. The reconstituted saag was comparable with freshly cooked saag in consistency, flavour and taste. SRA

FRUITS

69

Alzamora (SM), Tapia (MS), Argaiz (A) and Welli (J). **Application of combined methods technology in minimally processed fruits.** *Food Research International* 26(2); 1993; 125-130

This paper presents the processes developed for preserving 'high moisture fruit products' (peach, pineapple, mango, papaya, chicozapote, banana) in 7 countries in the frame of CYTED-D program. The new technologies were based on the combination of a mild heat treatment, a slight a_w reduction, and addition of antimicrobials ('hurdle effect'). These minimal processes are energy efficient, satisfactory to preserve fruits *in situ* and open new possibilities for export markets. High moisture fruit products are shelf-stable during at least 4-8 months of storage. AA

70

Proceedings of national symposium on export of fruits, vegetables and floricultural products. 7th - 8th April 1992, New Delhi. 226; 1992

Technical papers covered in this proceedings are export status and potential of horticultural produce by Patnaik, G. (pp 19-28); how to enter into export trade of fruits, vegetables and floricultural products by Dattatreyulu, M. (pp 29-47); research efforts in promoting export of fruits, vegetables and flowers from India by Chadha, K. L. (pp 49-63); export of fruits, vegetables to European markets by Singh, R. N. (pp 117-121); pesticides in foods and regulatory measures by Chadha, D. S. (pp 123-129); pesticides residues on fresh fruits and vegetables for export by Aswathi, M. D. (pp 131-136); transportation of perishable by air-facilities at airports by Nair, P. S. (pp 145-150); carrying perishables: the multimodel way by Malik, P. S. and Gupta, A. K. (pp 151-154); transportation of fruits, vegetables and floricultural products by ocean freight by Sawhney, R. P. (pp 155-158); packaging requirements of fresh produce for export by Bhowmik, S. R. (pp 159-177); transportation of fruits, vegetables and horticultural products by ocean freight by Bhansali, R. K. (pp 179-186). CSA

71

Prestamo (G) and Manzano (P). **Peroxidases of selected fruits and vegetables and the possible use of ascorbic acid as an antioxidant.** *Hortscience* 28(1); 1993; 48-50

The various isoenzymes of peroxidase were determined in potato (*Solanum tuberosum* L.), carrot (*Daucus carota* L.), tomato (*Lycopersicon esculentum* Mill), Kiwifruit (*Actinidia deliciosa* A. chev.), cauliflower (*Brassica oleracea*), green beans (*Phaseolus vulgaris* L.), and horseradish (*Armoracia rusticana* Gaertin, Mey Scherb). There was only one isoenzyme in cauliflower (70 kDa), two in Kiwifruit (45-43 kDa), and a range of isoenzymes (120-36 kDa) in horseradish. Between 2 and 170 µm ascorbic acid was required to inhibit peroxidase activity (PA) completely in all assayed extracts. As more ascorbic acid was added, the PA reaction was delayed 75-120 min. SRA

Apples

72

Hansen (K) and Poll (L). **Conversion of L-isoleucine into 2-methylbut-2-enyl esters in apples.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 178-180

Intact 'Golden Delicious' apples (Malus domestica, Borkh.) were infiltrated with a L-isoleucine sol. to investigate its conversion into volatile esters. It was found that the L-isoleucine treatment caused an increased production of 2-methylbut-2-enyl esters, especially the acetate ester, but also of ethyl 2/3-methylbutanoate, 2/3-methylbutanol and most 2/3 methylbutyl esters. AA

73

Hough (G), Chirife (J) and Marini (C). **A simple model for osmotic dehydration of apples.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 151-156

A model was developed for osmotic dehydration of fruit which takes into account outgoing water, incoming solute and shrinkage of fruit during the process. The model was experimentally verified by lab. dehydration of apple slices using 55 g/100 g glucose syrup at 45°C. The model adequately described experimental results in terms of lost water, gained solids, reduction of a_w and shrinkage during osmosis. By fitting the model to experimental values, apparent diffusivity values at 45°C for outgoing water and incoming sugar were 1.9×10^{-10} and 1.5×10^{-10} m^2/s, respectively. AA

Apricots

74

Sharma (KD) and Sharma (PC). **Some product from wild apricot grown in dry temperature regions of Himachal Pradesh.** *Beverage and Food World* 20(4); 1993; 22-23

A brief account of preparation of different products from wild apricot for its profitable utilization is presented. Aspects include, fruit characteristics, preparation of processed products (jam, mixed fruit jam, chutney, squash, drink, toffee and powder). SRA

Ber

75

Chavan (UD), Adsule (RN) and Kadam (SS). **Processing of ber. III. Preparation of dried ber powder and tuty-fruity.** *Beverage and Food World* 20(4); 1993; 28-29

A process for drying of ber fruits has been developed. In this process, the ber fruits were blanched in hot water for 2-3 min followed by sulphiting at 2 g sulphur/kg fruit. They were dried at 60°C for 40-48 h, packed and sealed. This could be eaten as such or after reconstitution in 40% sugar sol. Fruits can also be powdered and used in different bakery products. Ber fruits can be used in preparation of tuty-fruity, where fruits are cut to small cubes, and added with sugar and acetic acid during syruping process. This can be used in bakery and other products. SRA

Cherimoya

76

Palma (T), Stanley (DW), Aguilera (JM) and Zoffoli (JP). **Respiratory behaviour of cherimoya (*Annona cherimola* Mill) under controlled atmospheres.** *Hortscience* 28(6); 1993; 647-649

Respiration rates of 'Concha Lisa' cherimoyas at 10°C were monitored in a flow-through system using O_2 consumption and CO_2 production under 5, 10, 15 or 20% O_2 atm. A typical climacteric rise was observed 15 days after harvest under normal (20% O_2) atm while this event was delayed in 10 and 15% O_2. Fruits kept in 5% O_2 did not show a detectable climacteric rise and did not produce ethylene. All fruits ripened normally after being transfered to air storage at 20°C; however, the time needed to reach an edible condition differed with treatment and was inversely proportional to O_2 content. Study suggests that 'Concha Lisa' cherimoyas can be maintained at 10°C with 5% O_2 for upto 43 days and still ripen normally and remain acceptable after 4 days at room temp. SRA

Citrus

77

Garcia-Viguera (C), Tomas-Barberan (FA), Ferreres (F), Artes (F) and Tomas-Lorente (F). **Determination of citrus jams genuineness by flavonoid analysis.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 255-259

An easy technique that enables the analysis of flavonoids from citrus jams is described. The flavonoids from commercial sour orange, sweet orange, mandarin, lemon, bitter lemon, grapefruit and lime jams were analysed by HPLC. Each citrus jam has a characteristic flavonoid pattern that can be used in genuineness detn. Commercial jams produced with mixtures of orange, lemon and grapefruit

can easily be characterized by HPLC. No differences between the flavonoid profiles of natural fruits and those of the corresponding jams were observed, showing that the manufacturing process does not affect the flavonoid profile and therefore that this profile can be used in genuineness studies. AA

Figs

78

Bruland (HG), Matthiaschk (G), Sanitz (W), Vierkötter (S), Weber (R), Wenzel (H). **A sampling plan for a screening of aflatoxins in dried figs.** *Deutsche Lebensmittel-Rundschau* 88(6), 1992; 183-185 (De)

Grapefruits

79

McDonald (RE), Nordby (HE) and McCollum (TG). **Epicuticular wax morphology and composition are related to grapefruit chilling injury.** *Hortscience* 28(4); 1993· 311-312

Differences in chilling injury (CI) susceptibility between 'Marsh' grapefruit (*Citrus paradisi* Macf.) from interior and exterior tree canopy positions were analysed to investigate the hypothesis that epicuticular wax morphology and composition influence CI development during storage at 5°C for 5 wks and 80 to 92% RH. Interior canopy fruit had significantly less CI than exterior canopy fruit. Similarly, shaded surface of fruit from the exterior canopy had significantly less CI than sunexposed surfaces. Components of the epicuticular wax, in decreasing order of abundance, were terpenoids, aldehydes, hydrocarbons and alcohols. Hydrocarbons (n-alkanes) were significantly less abundant in the epicuticular wax on shaded and interior fruit surfaces, respectively. Study indicated that the morphology and composition of crystalline wax are influenced strongly by canopy position. SRA

Grapes

80

Dhillon (WS), Bindra (AS), Cheema (SS) and Sohan Singh. **Note on effect of berry thinning on quality of grapes cv. Perlette** *Indian Journal of Horticulture* 49(1); 1992; 50 52

Berry thinning from the clusters of vines was adjusted 20, 40, 60 and 80% levels Increasing berry removal significantly decreased shot-berry %. Shot berries increased from 0.6% to 2.6, 8.2, 16.6 and 29 5% with removal of 60, 40, 20% and in control respectively. A significant fall in TSS was observed when berry removal reduced from 80 - 20%. H ghest TSS (17.8%) was recorded under 80% berry thinning, and lowest (13.9%) under control. Highly significant lower acidity was observed in berry thinning when compared to no berry removal. Max. fruit acidity of 0.83% was found in control and min. of 0.47% under 80% berry removal. Thus 40% berry removal produced bunches of acceptable size and quality. SRA

Litchi

81

Roychoudhury (R), Kabir (J), Dutta Ray (SK) and Dhua (RS). **Effect of calcium on fruit quality of litchi.** *Indian Journal of Horticulture* 49(1); 1992; 27-30

Horticultural Research Station, Mondouri, India, carried out pre-harvest sprays of 1.0% Ca as $Ca(NO_3)_2$ and 0.6% Ca as $CaCl_2$ using tween 20 as spreader on 7 different replicated trees, each treatment at 20 and 10 days before harvest of litchi Bombai cv. Fruits harvested at 58 days of fruitset were stored at 29-32.5°C ambient temp. and 69-78.5% RH using litchi leaves as packing material in bamboo basket. Fruit wt., length, diam., sp. gr., peel and stone wt., biochemical constituents, titratable acidity, ascorbic acid content were analysed. Pre-harvest sprays of 0.6% $CaCl_2$ improved fruit wt. and aril %, pulp:peel and pulp:stone ratio. Fruit quality in terms of TSS, total and reducing sugar was much better in $Ca(NO_3)_2$ sprayed fruits while TSS:acid and sugar:acid ratio was more with $CaCl_2$ spray as $Ca(NO_3)_2$ treatment developed more acidity. Ascorbic acid content was higher in $Ca(NO_3)_2$ treated fruits. SRA

82

Yuniarti and Suhardi. **Ripening retardation of Arumanis mango.** *ASEAN Food Journal* 7(4); 1992; 207-208

Arumanis mango harvested at optimal picking maturity were treated with: (1) 2, 4, 6 or 8% $CaCl_2$ sol., (2) 4, 5, 6 or 7% wax emulsion, (3) wrapping in perforated polyethylene bags with 2.5, 5.0, 7.5 or 10% $KMnO_4$ added, (4) wrapping in sealed polyethylene bags with 2.5, 5.0, 7.5 or 10% $KMnO_4$ added, and (5) control with no dipping or wrapping. Mangoes treated with (4) showed retarded ripening more than the other treatments. In (3) treated mangoes ripening was retarded only for 1-3 days. The wax emulsion at 6-7% had the greatest effect in retarding ripening. $CaCl_2$ treatment was less effective. After 19 days at room temp. the control fruit was not suitable for consumption. SRA

83

McCollum (TG), D'Avino (S) and McDonald (RE). **Heat treatment inhibits mango chilling injury.** *Hortscience* 28(3); 1993; 197-198

'Keitt' mango (*Mangifera indica* L.) were kept at 38°C for 0, 24 or 48 h before storage at 5°C for 11 days. During this storage period non-heated mango fruit developed severe chilling injury (CI), which was manifested as rind discoloration and pitting. Heating significantly reduced CI. Non-heated fruit produced a transient burst of ethylene evolution following transfer to 21°C. Heated fruit did not produce similar burst. Non-heated and heated fruit ripened in normal pattern as indicated by changes in firmness, colour and composition. Study indicated that mango tolerance to chilling temp. may increase after pre-storage heat treatment. SRA

84

Grag (N), Kalra (SK) and Tandon (DK). **Quality evaluation of market raw mango powder and mango leather.** *Beverage and Food World* 20(2); 1993; 13-14, 18

Raw mango powder and mango leather available in Lucknow market and lab. samples (control) were evaluated for their physico-chemical and microbiological quality. The moisture content was lower in commercial samples than lab. samples. TSS and acidity were higher in market samples than in control. Mango leather from market and control showed similar features except vitamin C and colour where the latter was found superior with a lower colour value of 0.32%. Bacterial and fungal loads in commercial samples varied between 10^1 to 10^4 cfu/g irrespective of type of packing due to improper handling. The lab samples were free from any bacterial contamination. Significant fungal counts (*Lepidopterous*, *Colleoptrous* and *Aspergillus*) were observed in lab. samples, since they were 1 yr old with high TSS and sugar. This study suggests a need for improved technology of processing and automization in the industry to upgrade quality of products. SRA

85

Charanjit Kaur and Khurdiya (DS). **Studies on mango sauce.** *Beverage and Food World* 20(4); 1993; 24-26

Mango sauce was manufactured from mature and ripe Dashehari mangoes at lab. level varying ratio of fruit and cane sugar were tried as 2:1, 4:1, 6:1 with corresponding acidities of 0.3, 0.5 and 0.7% respectively. The resultant sauce was evaluated. The overall sensory quality score of mango sauce increased with the increasing amount of cane sugar. A max. score of 7.75 was observed in the 2:1 ratio of mango and canesugar prepared from unripe mango. In the sauce from ripe fruits, the ratios 4:1 and 2:1 were found best. The ratio 2:1 with 0.5% acidity scored the highest. SRA

86

Yeun (CMC), Tan (SC), Joyce (D) and Cheam (P). **Effect of post harvest calcium and polymeric films on ripening and peel in Kensington pride mango.** *ASEAN Food Journal* 8(3); 1993; 110-113

This investigation showed that ripening in mangoes can be significantly slowed with postharvest application of 2-8% $CaCl_2$, either under 32-115 kPa pressure respectively. The

evel of peel injury re ulting from Ca treatment was r duced by th use of polymeric film packagng or by treati g warm fruit in warm Ca s l. SRA

Mosambi

87

Ku mar (R and Ganapathy (MM). **Performance of mosambi on different rootstocks.** *Indian Jo rnal of Ho ticulture* 49(3): 1992: 222-226

The pe formance of sweet orange cv. Mosambi viz *Tro er citrange*, *Carrizo citrange*, *Rubidoux trifol a e*, *Pomeroy trifoliate*, Rough lemon (*Citru jambhiri* Lush) Kodakithuli, Cleopatra (*C tru reshni* Tan) and Rangpur lime (*Citrus l mon a* Osbeck) on various root stocks u der r mfed conditio s of Chotanagpur (plateau egi n), Biha India, was studied. Tree growth was sign f cantly higher in *T citrange* followed by Rough lemon and *C citrange*. In gener l, increas g trend of yield was observed with *T. ci nge* x *c r nge* and Rough lemon upto 9th yr. Rou h l mon recorded the highest % juice. *R rifo te*, *P. trifo ate*, *Cleopatra mandarin* nd *C ang* ro tsto ks produced max. % of TS. *C x a e* roved as the best rootstock f llow d by Rough lemon and *T. citrange*. SRA

Muskmelon

88

Art s (F), Escriche (AJ), Martinez (JA) and Ma n JG. **Quality factors in four varieties of melon (*Cucumis melo*, L.).** *Journal of Food Qu y* 16(2), 1993; 91-100

Fo r spanish var of muskmelon (piel de Sapo, A na llo, Galia and Tendral)were studied for a y chara teristics at harvest. Var. Piel de a showed max wt., caliber, edible portion at w s the most oval shaped; Amarillo had max s, luble so ids, non-reducing sugars and th low st respiratn rate. Galia showed lowest pulp fi mness, acidity, max reducing and n n-reducing sugars, mineral nutrients and was the most spherical shape and Tendral s wed max values of peel thickness, pulp r nes a dity, respiration rate and lowest alu es of so uble solids and mineral nutrients. D

Peaches

89

Chanana (YR), Nijjar (GS), Kanwar (JS), Kaundal (GS), Brar (SS), Deol (IS). **Studies on the performance of a new peach cultivar suitable for sub-tropics.** *Indian Journal of Horticulture* 49(1); 1992; 37-39

Punjab Agricultural University, Ludhiana, India, collected data during 1987-90 on flowering, fruit set, fruit wt., maturity, yield and quality of Flordasun and TA-170 peach var. introduced from Florida, USA. There was no difference in dates of flowering in both var. TA-170 having distinct earliness in ripening by 1 wk., better keeping and shipping quality, and relative resistance to fruitfly in comparison to Flordasun, appears to be suitable for sub-tropical climates. SRA

90

Gradziel (TM), Beres (W), Doyle (J) and Weeks (C). **'Rizzi': A processing Clingstone peach with extended postharvest storage potential.** *Hortscience* 28(3), 1993; 230

'Rizzi' Clingstone peach (*Prunus persica* (L.) Batsch) is a 'late' season processing peach with extended postharvest storage potential. 'Rizzi' compares favourably with that of 'Ross' and Dr. Davis', which are the recognized standards for processing peaches. Fresh fruit held in air storage for 8 wks at 0°C and 90% to 95% RH have a high quality processed product. BV

91

Cantor (S), Meredith (FI) and Wicker (L). **Postharvest changes of pectic substances in chilled peaches.** *Journal of Food Biochemistry* 16(1); 1992; 15-29

Red globe peaches were harvested at the threshold mature stage and either stored at 0°C after preripening at 20°C for 48 h or stored directly at 2°C. Total pectin increased from 7.49 mg/g fresh wt. in the threshold mature sample to 10.21 mg/g in pre-ripened fruit stored at 0°C and 12.83 mg/g in fruits stored directly at 2°C. Depending on extraction and storage protocol, between 26% and 73% of total

pectin was solubilized. Chelator-soluble fractions had a low degree of esterification (DE ca. 20%), whereas other fractions were highly methylated (DE ca. 56% to 74%). Average DE did not vary between samples. DEAE-cellulose chromatography revealed an uneven distribution of methyoxyl groups. Two prominent peaks were observed in chromatograms of chelator-soluble extracts from threshold-mature fruit and fruit stored directly at 2°C. One peak was observed in chelator-soluble pectin from preripened fruit stored at 0°C. AA

Strawberries

92

Collins (JK) and Perkins-Veazie (P). **Postharvest changes in strawberry fruit stored under simulated retail display conditions.** *Journal of Food Quality* 16(2); 1993; 133-143

'Cardinal' strawberry fruit were placed in plastic boxes with plastic dome lids (PDL) or with polyethylene wrap (PE), warmed to 25°C for 8 h and stored at 1°C or 5°C to stimulate retail storage temp. conditions. For all treatments, fruit held at 5°C decayed and deteriorated more than fruit held at 1°C. During storage at 1°C or 5°C, fruit in boxes with PE accumulated CO_2 (0.75 - 2% CO_2/mg), had less wt. loss and better colour retention than fruit in boxes with PDL. After 3 days of storage, precooled strawberries exposed to 8 h of warming had more wt. loss and worse appearance than fruit held continuously at 1°C; these differences were not apparent after 7 days. AA

CONFECTIONERY, STARCH AND SUGAR

Starch

93

Kramholler (B), Pischetsrieder (M) and Severin (T). **Maillard reactions of dextrin and starch.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 227-229

When dextrins or starch are heated with propylamine in neutral aqueous sol. at 100-130°C a brown colouration is observed. From the reaction mixture 3-hydroxy-2-methyl-1-propyl- 4(1H)-pyridone 11, 1,4-dihydro-2-methyl-1-propyl-4-propylimino-3-pyridinol 12 and 5-hydroxymethyl- 1-propyl-pyrrol-2-aldehyde 13 can be extracted with organic solvents and separated by HPLC. Enzymatic hydrolysis effects the release of 1(3-hydroxy-1-propyl-2-pyrrolyl)-1-ethanone 10 from a glycosidically bound precusor. AA

Sugar

94

Bhatt (S). **Separation of fructose from carbohydrate mixtures. I. Non-chromatographic methods.** *Indian Sugar* 43(7); 1993; 463-468

Fructose is obtained from glucose-fructose mixtures like high fructose corn syrup or invert sugar by non-chromatographic methods based on the differences in the physical, chemical or biochemical properties of the 2 sugars. Selective crystallization of sugars, calcium fructosate precipitation, selective chemical transformation of glucose (selective oxidation of glucose to gluconic acid, selective conversion of glucose to furanic polyalcohols), biochemical separations (enzymatic oxidation of glucose, selective fermentation of glucose), and reverse osmosis are important aspects in the non-chromatographic methods. SRA

95

Purnomo (H). **Sugar components of coconut sugar in Indonesia.** *ASEAN Food Journal* 7(4); 1992; 200-201

This study indicated that sucrose (70-79%) was the major component of all samples (from Malang, Yogyakarta and Denpasar) of coconut sugar, followed by glucose (3%) and fructose (9%). Variations in sugars (75-88%) between samples were observed due to slightly different procedures used from one region to another or the different raw material quality. SRA

Sugarcanes

96

Singh (AP), Billore (SD) and Chatterjee (A). **Biophysical-chemical and economical evaluation of sugarcane (*Saccharum officinarum*) hybrids.** *Indian Sugar* 43(7); 1993; 471-475

Field trial from 1986-88 to 1990-92 on 8 sugarcane hybrids (CoJn 79-81, 80-120, 80-141, 80-14, 80-116, 80-151, 82-585, 82-600) and the local check Co 6304 were conducted as autumn planting. Hybrids Cojn 80-151 showed max. cane sugar yield, sucrose % and was most stable, energy efficient and economical for autumn planting in Vindhyan Plateau, India. SRA

97

Billore (SD), Bargale (M) and Singh (AP). **Sugar and sugarcane production and their utility dynamics in 2000 A.D.** *Indian Sugar* 43(7); 1993; 477-479

Data on production of sugar, gur, and khandsari were regressed to obtain linear growth rate, coefficient of variation and expected production in 2000 A.D. In 2000 A.D. the production of sugarcane in the country would be 286406.90 thousand t., out of which 159432, 37610.70 and 89364.20 thousand t. would be used for sugar, gur and khandsari respectively. The ultimate sugar production would be 16042.50 thousand t. with per capita consumption of sugar and gur and khandsari 21.17 and 7.07 kg/annum respectively. SRA

BAKERY PRODUCTS

98

VIII Indian convention of food scientists and technologists on recent develpments and future trends in milling and baking technology. 10-12 May 1990, Mysore.132; 1990

Abstracts of papers presented at the posters session are covered under the following topics: analytical methods, confectionery, dairy science, fats and oils, food presevation, fruits, vegetables and plantation products, grain science and storage, machinery, milling and baking, meat, fish and poultry, microbiology, nutrition and waste utilization. CSA

Bread

99

Frasse (P), Lambert (S), Richard-Molard (D) and Chiron (H). **The influence of fermentation on volatile compounds in French bread dough.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 126-132

The influence of the fermentation on the neutral/basic volatile fraction of the French bread dough was investigated. Three types of dough were compared by GC-MS and GC/olfactometry analysis of the corresponding aromatic extracts obtained by vacuum desportion: (YF) control dough obtained by the straight dough method, (YNF) yeasted but not fermented dough (which was conditioned just after the mixing step) and (NYF) not yeasted but fermented dough (like the control one but without incorporation of the baking yeast in the system). more than 40 components were identified among with 20 alcohols, 7 esters, 6 lactones, 6 aldehydes, 3 alcanes and 1 sulphur compound. Except for the aldehydes and the alcanes, all these classes of compounds increased with the activity of the yeast *Saccharomyces cerevisiae* [from (NYF) to (YF)], notably the alcohols due to the formation of fusel alcohols. The 2,3 butanedione, 3-methyl-1-butanol, 2-methyl-1-butanol, methional, 2-phenyl ethanol and two unidentified components with a pungent and a mushroom-like odour, were the most odourant compounds generated during the fermentation of the dough, as shown by the aroma extract dilution analysis of the 3 aromatic extracts. AA

100

Qarooni (J), Posner (ES) and Ponte (JGJr). **Production of tanoor bread with hard white and other U.S. wheats.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 100-106

A small-scale test baking procedure and a scoring system were developed to evaluate the suitability of U.S. wheats for the production of

tanoor bread (a single-layered, flat bread). Eleven wheat samples (hard white winter, hard red winter and soft white winter) were milled to 85% extraction and made into tanoor bread. The data for flour quality and bread scores were subjected to correlation and stepwise regression analyses. Flour protein quality and starch relative viscosity measured by the rapid visco-analyser were highly correlated with many aspects of bread quality. The quadratic function of the valorimeter value and relative viscosity on the bread quality indicated that extremes in dough strength and starch relative viscosity adversely influence the quality of tanoor bread. The results of this study indicated that optimum tanoor bread was produced from flour (85% extraction) of 11.0 to 13.0 g/100 g protein. AA

101

Qarooni (J), Posner (ES) and Ponte (JGJr). **Production of pita bread with hard white and other U.S. wheats.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 93-99

Fifteen samples of U.S. wheats (hard white winter, hard red winter, hard white spring and soft white winter) were milled to flour of 80% extraction and made into pita bread (two-layered, flat bread). The best quality product was obtained from flour samples of 9.5 to 12.0 g/100 g protein. Extremes in protein content adversely influenced the product quality. The flour (80% extraction) quality data and individual scores of bread quality were subjected to correlation and stepwise regression analyses. The latter identified the flour quality characteristics that influenced the individual and overall bread scores. The total score of pita bread was found to be influenced by the quadratic function of starch relative viscosity measured by the rapid visco-analyser. AA

Cookies

102

Idris (NA), Abdullah (A) and Embong (MS). **Texture characteristics of pressed cookies based on palm oil shortenings.** *ASEAN Food Journal* 7(4); 1992; 202-204

In this study the textural attributes of cookies made using palm oil (PO), hydrogenated palm oil (HPO), and interesterfied palm oil (IEPO) shortenings were examined. Shortenings made of PO had good consistency with a yield value of 260 g/cm^2 and were hard more gritty, and spreadable cookies made of HPO had higher solids content than PO and IEPO. Cookies from IEPO shortenings was significantly ($P < 0.5$) less hard than from those based on PO and HPO. SRA

MILK AND DAIRY PRODUCTS

103

Vasavada (PC), Chandler (RE) and Hull (RR). **Evolving methodologies for microbiological examination of milk and dairy foods.** *Dairy, Food and Environmental Sanitation* 13(9); 1993; 510-515

Some of the concepts and instrumental approaches to microbiological analysis and modifications of several conventional tests currently finding acceptance in dairy microbiology lab. are discussed in this article. Aspects covered are rapid methods and automation in microbiology, adjuncts to conventional methods, instrumental methods for detection of microbial growth and metabolism, rapid quick screening method, rapid detection, characterization and identification of pathogens, toxins, and residues, and predictive microbiology. SRA

Milk

104

Moustafa (SI) and Marth (EH). **Occurrence of *Escherichia coli*, *Pseudomonas aeruginosa* and *Listeria monocytogenes* in abnormal milk.** *Dairy, Food and Environmental Sanitation* 13(2); 1993; 70-73

Results of the California Mastitis Test indicated that milk from 94 of 195 (48%) samples was abnormal, suggesting the possibility of mastitis. Of the 94 positive samples, 27, 26, 17 and 24 respectively came from the right front, right rear, left rear, and left front quarters. Isolates of *E. coli* were serotyped and

were serogroup O. A-O *E. coli* isolates were sensitive to ampicillin, carbencillin, cephalothin, erythromycin and tetracycline. None of the isolates was sensitive to gentamycin, neomycin and streptomycin. The 2 isolates of *Ps. aeruginosa* were sensitive to carbenicillin and tobramycin and both were resistant to gentamycin. One of the two isolates was sensitive to ampicillin and pipevacillin. *L. monocytogenes* was not recovered from the milk samples. SRA

105

Mistry (VV), Hassan (HN) and Robinson (DJ). **Effect of lactic and protein on the microstructure of dried milk.** *Food Structure* 11(1); 1992; 73-82

SEM showed that powder particles with the highest lactose had wrinkled surface and dents; powder particles with lower lactose including ultrafiltered and diafiltered milk powders only dents without wrinkles. Diafiltered skim milk with 0.9% lactose raised to 15.6% by addition of lactose powder and then spray dried showed only a wrinkled surface. Permeate powder with 82.8% lactose had smooth particles with some wrinkles. Lactose and protein in milk powder influence the surface structure. SD

106

Sharma (SK), Hill (AR) and Mittal (GS). **Effect of milk concentration, pH and temperature on aggregation kinetics and coagulation properties of ultrafiltered (UF) milk.** *Food Research International* 26(2); 1993; 81-87

Aggregation kinetics of renneted ultrafiltered (UF) milk were monitored by measuring the complex viscosity (μ^*) at various times with a Nametre viscometer. The rate of aggregation increased with an increase in milk concn. (1X-4X) and temp. (28-37°C) and a decrease in pH (6.8-6.0). The coagulation time (CT) decreased with a decrease in pH from 6.8 to 6.0 and with an increase in temp. The CT decreased with an increase in milk concn. when milk pH was adjusted (7.0), but remained unaffected when pH was adjusted by adding lactic acid (6.8-6.0). The curd firmness index increased with an increase in both milk concn. and temp., and with a decrease in pH. The aggregation kinetics suitably followed the Scott-Blair and Burnett model ($\mu^* = \mu^*_\infty \exp(-\lambda/t^*)$), where μ^*_∞ = limiting value of μ^*, cP; λ = time at which $\mu^* = \mu^*_\infty/e$, min and t^* = time after aggregation, min. AA

Milk products

107

Richardson (NJ), Booth (DA) and Stanley (NL). **Effect of homogenization and fat content on oral perception of low and high viscosity model creams.** *Journal of Sensory Studies* 8(2); 1993; 133-143

Assessed under low-intensity red illumination, homogenized and thickened higher fat milk samples evoked higher sensory ratings of creaminess than did the unhomogenized or lower-fat milks that had not been thickened to the viscosity of double cream. Furthermore, perceptual ratings of fat content showed the same dependency on homogenization, higher fat and thickness and were entirely accounted for by the creaminess ratings. This indicates that assessors recognize the type of milk or cream most similar to a rated standard and infer its fat content on the basis of tactile patterns produced in the mouth by forces at the surface of small and even-sized dairy fat globules when bulk forces are produced by sufficient viscosity. AA

Cheese

108

Heisserer (DM) and Chambers (EIV). **Determination of the sensory flavour attributes of aged natural cheese.** *Journal of Sensory Studies* 8(2); 1993; 121-132

An expert descriptive panel identified, defined and referenced 30 flavour attributes which described with a few exception significant differences among the 42 cheese amples. Attributes common to all samples, those common to most of the samples and those which are specific to some of the samples were clearly understood. The results of the factor analysis indicated that no one factor solution best described the data. Substantial reduction

of the number of attributes to adequately describe natural cheese flavour was not feasible. SD

109

Jack (FR), Piggott (JR) and Paterson (A). **Discrimination of texture and appearance in Cheddar cheese using customer free-choice profiling.** *Journal of Sensory Studies* 8(2); 1993; 167-176

Free-choice profiling was easy and effective to discriminate quality difference, particularly texture and appearance, in Cheddar cheese samples evaluated by a consumer panel. In appearance factor colour played an important role; also hard, dry, crumbly samples were discriminated from soft, smooth samples and mature texture being sticky, wet were discriminated from immature texture with rubbery characteristics. SD

110

Taneya (S), Izutsu (T), Kimura (T) and Shioya (T). **Structure and rheology of string cheese.** *Food Structure* 11(1); 1992; 61-71

The rheological properties of cheese curds being highly dependent on temp., their flowability lost below 35°C, strong cheese manufacture process is prefered above that temp. Cheese curd being incompressible viscoelastic body, the relationship between shear rate and stress was well represented by the power law equation. The stringiness is well defined by a area of the fibrous material that appears when the cheese is torn because of the breakage of the protein matrix arranged in the longitudinal direction, the release of water and fat dispersed within the matrix. Cheese curd network consisting of casein subunits was clear at 5.4 pH. SD

111

Parashar (SC) and Jha (YK). **Development of vegetarian cheese from buffalo milk blended with soy milk using fungal rennet.** *Beverage and Food World* 20(2); 1993; 23-25, 27

Vegetarian cheese was made from milk containing 10, 20 and 30% soy milk with Marzyme, cheese having 10% and 20% soy milk with Marzyme, cheese having 10% and 20% soy milk were rated superior than control samples. Cheese samples containing 10 to 20% soy milk showed higher glycolysis, proteolysis and lipolysis than control samples. AA

Blue cheese

112

Gonzalez de Llano (D), Ramos (M) and Martin-Alvarez (PJ). **Comparative study of different methods for evaluating proteolysis in blue cheese.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1); 1993; 29-31

Methods of evaluating proteolysis using different precipitants and nitrogen evaluation methods were assessed. The coefficient of detn. (R^2) values relating the various methods and the ripening period were positive and > 0.87. Amino acid nitrogen in the fraction soluble in 12% trichloroacetic acid had the highest coefficient value (R^2 = 0.95). Of all the methods for evaluating N, dialysis had the highest value of R^2 with respect to water-soluble nitrogen determined using the Kjedahl method. However, dialysis is not applicable to blue cheeses with high mould contents. Cluster analysis was applied to the ripening index values and yielded groupings according to the method of nitrogen evaluation. AA

Cheddar cheese

113

Jordan (KN) and Cogan (TM). **Identification and growth of non-starter lactic acid bacteria in Irish Cheddar cheese.** *Irish Journal of Agricultural and Food Research* 32(1); 1993; 47-55

A set of 160 isolates of non-starter lactic acid bacteria (NSLAB) from 8 commercial Cheddar cheeses were classified as *Lactobacillus curvatus* (23 strains), *L. plantarum* (45 strains), *L. casei* (89 strains) and heterofermentative lactobacilli (3 strains). No pediococci were found. All strains of *L. curvatus* required tryptone for growth in milk and Tween 80 for growth in broth. Most strains (82%) of *L. plantarum* metabolized citrate. The total

amounts of lactate produced by *L. casei* and *L. plantarum* in milk averaged 8.2 (s d. 1.94) and 4.9 s.d. 1.94) and 4.9 (s.d 2.18 g/l, respectively Sixty-nine out of 77 strains tested (representing all 3 species) grew in 6% salt while 45 strains grew in 8% salt. NSLAB had an average generation time of 8.5 days in cheese ripened at 6°C Citrate utilization occurred in only one or four cheeses examined but considerable variation in the levels of lactose occurred during ripening. AA

Goat cheese

114
Mor-Mur (M), Carretero (C), Pla (R) and Guamis B). **A survey on the microbiological quality of a semi-soft on-farm manufactured goat cheese.** *Food Microbiology* 9(4); 1992; 345-352

The microbiological quality of a 60 day ripened, on-farm manufactured semi-soft, mixed coagulation cheese was evaluated. Samples from 42 cheeses were analysed for their aerobic mesophilic counts, lactic acid bacteria in 3 solid media (MRS Agar, M17 Agar and MSE Agar), yeasts and moulds, psychotrophs, *Enterobacteriaceae*, coliforms and faecal coliforms, coagulase-positive staphylococci, sulphite-reducing clostridia and *Salmonella* spp. The aerobic mesophile bacteria constituted the largest group of microorganisms found. The largest number of lactic acid bacteria was obtained with MRS Agar; M17 Agar and MSE Agar gave similar counts although the latter was generally lower. The mean log cfu g^{-1} of psychrotrophic microorganisms was 4.77 and for moulds and yeasts 4.30. 13, 25 and 45.8% of the samples were found negative for enterobacteria, coliforms and coagulase-positive staphylococci, respectively. Sulphite-reducing clostridia, faecal coliforms and *Salmonella* was not detected. The mean pH of the samples was 4.07 plus or minus 0.5 AA

Mozzarella cheese

115
Latha Sabikhi and Kanawjia (SK). **Effect of type of acids on the quality of Mozzarella cheese manufactured from admixture of goat and buffalo milks.** *Indian Journal of Dairy Science* 46(1): 1993; 17-20

The effect of acetic, lactic and hydrochloric acids on sensory, physico-chemical, rheological and textural properties of Mozzarella cheese manufactured from an admixture of goat and buffalo milks (1:1 ratio) were studied. The av. scores for flavour were 8.03, 8.37 and 8.87 for cheese made with acetic, lactic and hydrochloric acids respectively. The max. of 4.73 for body and texture was for the cheese made from hydrochloric acid and the least of 3.87 for lactic acid. The av. score for appearance was 2.60 for lactic acid, 2.73 for acetic acid and 2.90 for hydrochloric acid. Max. fat recovery (92.45) was in cheese made from acetic acid. The hydrochloric acid was found to be the most suitable acidulant for production of good quality Mozzarella cheese. SRA

Ice cream

116
Caldwell (KB), Goff (HD) and Stanley (DN). **A low-temperature scanning electron microscopy study of ice cream. I. Technique and general microstructure.** *Food Structure* 11(1); 1992; 1-9

LT-SEM revealed 4 distinct structural phases viz ice crystals, air bubbles, fat globules and serum. Air bubbles 10-60 μm diam. were lined with fat globules; Ice crystals, 40 μm mean dia. showed a characteristic reticulate structure after sublimation which greatly influenced the appearance of the ice-cream micrographs. SD

117
Caldwell (KB), Goff (HD) and Stanley (DW). **A low-temperature scanning electron microscopy study of ice cream. II. Influence of selected ingredients and processes.** *Food Structure* 11(1); 1992; 11-23

The effect of incorporation of polysaccharide stabilizers, freezing rates and storage times and temp. on microstructure was studied. Ice crystals and air bubbles increased in size as the freezing rate was reduced. Stabilized ice cream

initially had smaller mean ice crystal diameters than unstabilized samples and the structure was held better at fluctuating temp. SD

Milk powders

118

Ravindra Kumar, Surendra Nath (B) and Rama Murthy (MK). **An objective method for the determination of flavour development and storage stability of whole milk powder.** *Indian Journal of Dairy Science* 46(1); 1993; 30-33

A method used for the estimation of steam volatile carbonyls has been tried for its usefulness as an objective test to assess the acceptability of whole milk powder (WMP). In the method, steam distillate from WMP was collected under standard conditions and its optical density (OD) was measured at 280 nm. The results showed a highly significant correlation (r = -0.96) between the increase in OD and decrease in organoleptic scores of the powder samples. Based on these results, it is suggested that WMP which shows more than 0.05 increase from the initial value of OD or show a value of 0.12 in the case of samples whose initial OD values are not known, may not be suitable for further storage. AA

Yoghurts

119

Ajam (N), Foong (CY) and Benjamin (P). **Yoghurt production from local cow's milk in Malaysia.** *ASEAN Food Journal* 8(3); 1993; 117-121

This paper report the results of using readily available local gelling agents and fruits on the microbiological, physical and biochemical characteristics of yoghurt. Yoghurt solely made from cow's milk tended to be soft and watery and unacceptable as a snack food. Sweetening and addition of gelling agent greatly improved the hedonic rating. Addition of mango and pineapple fruits further improved flavour. Chilling of yoghurt prevented changes in texture, aroma and flavours after 2 wks storage. SRA

Milk proteins

120

Legowo (AM), Imade (T) and Hayakawa (S). **Heat-induced gelation of the mixtures of α-lactalbumin and β-lactoglobulin in the presence of glutathione.** *Food Research International* 26(2); 1993; 103-108

The optimum conditions for obtaining the max. gel strength upon heating mixtures of α-lactalbumin and β-lactoglobulin were investigated at different concn. of glutathione (reduced type) and NaCl. Gel strength was determined after heating at 80°C for 15 min at pH 6.3 and a protein concn. of 8%. Max. gel strength for mixtures of α-lactalbumin and β-lactoglobulin in the ratio of 2:8, 5:5 and 8:2 were obtained at glutathione and NaCl concn. of 0 mM, 86 mM, 43 mM and 116 mM and 83 mM, respectively. Multiple regression analysis indicated that both glutathione and NaCl contributed significantly (P less than or equal to 0.01) to gel formation. The promotion of gel formation with glutathione was postulated to result from glutathione reacting with intramolecular disulphide bonds in the α-lactalbumin and β-lactoglobulin, thereby resulting in conformational changes. It was postulated that α-lactalbumin and β-lactoglobulin were interacting in the gelation of the mixed proteins. AA

121

Heelan (BA) and Corrigan (OI). **A comparison of the use of dairy proteins and synthetic polymers as emulsifying agents in the production of pharmaceutical systems.** *Irish Journal of Agricultural and Food Research* 32(1); 1993; 57-66

An adaptation of the turbidimetric technique of Pearce and Kinsella (1978) was used to determine the Emulsifying Activity Index (EAI) for sodium caseinate (SC), whey protein isolate (WPI), methyl cellulose (MC) and polyvinyl alcohol (PVA). The order of the EAI values was PVA > SC approx. WPI > MC. It was also concluded that the dairy proteins, SC and WPI, could be used in place of the synthetic emulsifying agents MC and PVA for the production of micropa ticles by emulsification and solvent evaporation techniques. AA

MEAT AND POULTRY

Meat

122
Buchanan (RL), Schultz (FJ), Golden (MH), Bagi (K) and Marmer (B). **Feasibility of using microbiological indicator assays to detect temperature abuse in refrigerated meat, poultry and seafood products.** *Food Microbiology* 9(4): 1992; 279-301

Twelve retail products were divided into three groups and stored at 5°C (adequate refrigeration, 12°C (moderate abuse), and 19°C (gross abuse). They were periodically sampled for aerobic plate counts (plates incubated at 28, 37 and 42°C), presumptive coliforms, confirmed coliforms, thermal tolerant coliforms, *Escherichia coli* and *Staphylococcus aureus*. No single indicator test was effective in all the food samples examined, but different assays were able to differentiate temp. abused versus adequately refrigerated samples in a number of products. SRA

123
Nordmark (B). **Recent developments in meat industry engineering.** *Food Technology in New Zealand* 28(4); 1993; 16, 19

This article briefly covers aspects on lamb boning, commercial progress, advantages, beef boning, mechanical dressing, meat tenderness, machine vision, energy and process integration and model software. SRA

124
Samoon (AH). **Flavour compounds in meat - a review.** *Beverage and Food World* 20(4); 1993; 13-15

This review analyses in detail the various aspects of meat flavour and factors affecting its perception and development in meat and meat products, with emphasis on major precursor compounds and flavour component reactions Role of lipids, proteins and amino acids carbohydrates and other meat constituents in development of meat flavour, effect of heat, irradiation, species variation in perception and development of meat flavour in beef, lamb and pork are discussed and several fertile areas for future research on meat flavour are highlighted. 3 references. SRA

Beef

125
Shehata (HA), Attia (EA) and Askar (A). **Improvement of the binding properties and texture of corned beef and formed beef ham.** *Deutsche Lebensmittel-Rundschau* 88(10): 1992; 318-321

126
Guth (H) and Grosch (W). **12-Methyltridecanal, a species-specific ordorant of stewed beef.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 171-177

127
Hefnawy (YA), Moustafa (SI) and Marth (EH). **Behaviour of *Listeria monocytogenes* in refrigerated and frozen ground beef and in sausage and broth with and without additives.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 167-170

128
Boakye (K) and Mittal (GS). **Changes in textural properties of beef *Longissimus dorsi* muscle during aging.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 145-150

Pork

129
Gupta (PK) and Chauhan (GS). **Bacteriological quality of some pork products.** *Beverage and Food World* 20(4); 1993; 18-20

Pig

130
Gill (CO) and Jones (T). **Assessment of the hygienic efficiencies of two commercial processes for cooling pig carcass.** *Food Microbiology* 9(4); 1992; 335-343

Swine

131

Pursel (VG) and Solomon (MB). **Alteration of carcass composition in transgenic swine.** *Food Reviews International* 9(3); 1993; 423-439

Rabbit

132

Sushil Kumar, Nair (RB) and Amla (BL). **Effect of post mortem chill and frozen storage on protein degradation of broiler rabbit muscles analysis by SDS-gel electrophoresis.** *Indian Journal of Animal Science* 63(10); 1993; 1042-1049

Biochemical variation in proteins of broiler rabbit muscles (*Longissimus dorsi* - LD; *Biceps femoris = BF) held at chill* (2-4°C) and frozen temp. (-10 to 12°C) were typed through SDS-PAGE. Electrophoretic pattern of extracts from prerigor LD and BF muscles revealed intrinsic differences between white and red muscles. The number of bands were more in LD muscle extract than in BF. Protein components of 54000 daltons just above the actin and 44000 just below the actin band observed in LD were lacking in BF. Initial 6 h chilling showed more marked influence on the banding pattern of BF muscle than that of LD muscle. The number of bands were reduced to 12 as compared to 15 bands in preaged BF muscle, possibly due to formation of actomyosin complex due to rigor mortis. The increased number of bands in 24 and 72 h aged muscles indicated degradation of proteins by endogenous enzymes. Protein band corresponding to 36000 daltons disappeared after 6 h aging and was not visible after 24 and 72 h aging in either muscle, whereas 40000 daltons band specific in preaged LD muscle also disappeared after 6 h chilling postmortem. The marked change observed in the electrophoretic pattern in 48 h frozen stored muscle was the development of 26000/27000 daltons band in both muscles might be related to postmortem tenderness parallel to well documented 30000 daltons band in cold and frozen stored chicken and beef muscles. AA

Products

Meat

133

Straub (B), Schollenberger (M), Kicherer (M), Luckas (B) and Hammes (WP). **Extraction and determination of biogenic amines in fermented sausages and other meat products using reversed-phase HPLC.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 230-232

A simple method is reported for the analysis of biogenic amines (BA) by means of reversed-phase-HPLC. The method is characterised by multi-channel UV detection (diodearray), subsequent post-column derivatization with O-phthaldialdehyde and 3-merceptopropionic acid and fluorescence detection. BA (putrescine, cadaverine, histamine, tyramine and 2-phenylethylamine) recoveries from meat products and especially fermented sausages ranged between 96 and 113% with a detection limit for amines of 0.5 mg/kg. BV

Poultry

Chickens

134

Marshall (DL), Andrews (LS), Wells (JH) and Farr (AJ). **Influence of modified atmosphere packaging on the competitive growth of *Listeria monocytogenes* and *Pseudomonas fluorescens* on precooked chicken.** *Food Microbiology* 9(4); 1992; 303-309

This study revealed that, in the presence of *Ps. fluorescens* growth of *L. monocytogenes* was stimulated at 3°C in air relative to growth alone. Little effect was noted on growth of *Ps. fluorescens* in the presence of *L. monocytogenes* at the lower temp. At 11°C growth of the spoilage bacterium was inhibited in mixed culture. Thus, both bacteria were capable of growth in the presence of each other. Slight differences were noted between growth of the bacteria either alone or in mixed culture. Modified atm. packaging generally had no effect on the interaction between two bacteria. SRA

135

Sheehy (PJA), Morrissey (PA) and Flynn (A) **Increased storage stability of chicken muscle by dietary α-tocopherol supplementation.** *Irish Journal of Agricultural and Food Research* 32(1); 1993: 67-73

Chicks were fed on diets containing 5, 25, 65 or 180 mg α-tocopheryl acetate/kg for 24 days and the stability of both raw and cooked muscle stored at 4 and -20°C determined by the thiobarbituric acid assay. Concn. of thiobarbituric acid-reacting substances (TBARS) were 4 to 10-fold higher in cooked muscle than in the corresponding raw muscle samples. TBARS concn. in cooked muscle from chicks fed on high α-tocopherol diets were significantly lower during refrigerated or frozen storage than those in muscle from chicks given low α-tocopherol. A similar protective effect of α-tocopherol supplementation was observed in raw muscle samples during frozen (-20°C), but not refrigerated (4°C), storage. The results confirm that incorporation of α-tocopherol into muscle by dietary supplementation is an effective means of prolonging the shelf-life of poultry products. AA

traits. Dietary effects appeared to be secondary to genotypic effects in influencing the growth traits. AA

137

Shukla (PK), Shrivastav (AK), Singh (RP) and Bedi (SPS). **Effect of dietary supplementation of manganese on egg production and egg quality of Japanese quail layer.** *Indian Journal of Poultry Science* 28(2); 1993; 116-119

The effect of 4 Mn feed levels 20, 50, 80 and 120 mg/kg on the production performance and egg quality characteristics of Japanese quails from 7th and 19th wk of age was studied. There was no change in the feed consumption, feed efficiency, egg mass, hen-day production, egg wt., body wt., albumen index, internal quality index, tibial bone wt. and shell thickness. % shell wt. was affected by the graded levels of dietary Mn, the highest being found at 80 mg/kg level. GS

Products

Chicken nuggets

Quails

136

Mishra (SK), Panda (B), Mohapatra (SC) and Shrivastav (AK). **Response of genotypes to dietary protein levels for growth and carcass quality traits in Japanese quail.** *Indian Journal of Poultry Science* 28(2); 1993; 106-115

The performance of 3 genotypes of Japanese quail during 5 wk of rearing period with respect to growth and slaughter related traits as affected by protein levels of isocaloric diets is reported. Dietary and genotypic effects were significant for almost all measures of body wt., gain in wt., feed consumption, feed efficiency and eviscerated wt. Differences among genotypes accounted for the greater portion of total phenotypic variability. Diet containing 24% crude protein supplemented with methionine and lysine (0.1% each) appeared to be as efficient as the diet containing 27% crude protein to maximise the growth performance

138

Kondaiah (N), Anjaneyulu (ASR) and Lakshmanan (V). **Utilization of spent hen components in chicken nuggets.** *Indian Journal of Poultry Science* 28(2); 1993; 144-146

The quality of chicken nuggets, prime, choice and economy type, containing different proportions of deboned meat and by-products was studied. Emulsion stability and cooking loss were significantly affected with decrease of lean meat and increase of by-products. Choice type formulation (50% lean and 20% by-products) did not differ significantly from prime type formulation (containing no by-products). Economy type formulation showed higher cooking loss (5.1%). By-products possessed lower emulsifying capacity and binding coeff. The 3 types differed only in texture and overall palatability but were comparable in appearance, flavour, juiciness and mouth coating. Prime type nuggets were significantly better than the economy type. GS

Eggs

139

Pandey (NK), Anand (SK), Verma (SS) and Ram Gopal. **Yolk position in raw and hard cooked eggs as influenced by strain, age of egg and egg position during cooking.** *Indian Journal of Poultry Science* 28(2); 1993; 120-124

Eggs from 5 layer and 4 broiler strains were examined for yolk position at 0, 7 and 14 days of ambient and refrigerated storage respectively in raw, cooked-on-side and cooked-on-end eggs. In raw eggs, strain effect was significant for side/side ratio only at 7th day of ambient storage and for bottom/top ratio at 0 day, whereas age of egg had significant influence on bottom/top ratio in most of the strain with higher ratio at 7th day of ambient storage. In hard cooked eggs, strain or age of egg effects were not significant for side/side ratio whether cooked on-side or on-end, but age of egg significantly influenced the bottom/top ratio with higher ratio at 7th day of ambient storage in both the cooking position groups. Further, the eggs cooked on-ends had lower side/side ratio and higher bottom/top ratio than eggs from same strain and storage period cooked on-sides. Variation among breeds was significant for both the ratios only in fresh hard cooked eggs with better ratios on light than in heavy breed irrespective of cooking position. In addition, a negative relationship was obtained between Haugh unit and bottom/top ratio in both raw and hard cooked eggs. AA

140

Johari (DC), Deepak Sharma, Kataria (MC), Singh (DP) and Sharma (RD). **Time trend in egg quality traits and their inheritance in control population of white leghorn.** *Indian Journal of Poultry Science* 28(2); 1993; 137-140

263 progeny of 23 sires and 71 dams belonging to 12th generation was studied for inheritance of egg quality. Albumen index ranged from 0.085 to 0.160, yolk index from 0.390 to 0.500, Haugh unit score from 82.38 to 103.10 and shell thickness from 0.254 to 0.370 mm in different generations. Albumen index and Haugh units were found to be highly heritable. GS

141

Mahanta (JD), Dutta (DJ) and Rahman (H). **Physical quality characteristics of indigenous and Khaki Campbell duck eggs.** *Indian Journal of Poultry Science* 28(2); 1993; 147-149

Duck eggs, pati vs. Khaki Campbell, were compared for their physical characteristics. The 2 genetic groups differed significantly in egg wt., shape index, sp. gr., yolk index, shell thickness and % of albumen and yolk. Pati duck eggs had significantly higher egg wt. and shape index. Yolk index and shell thickness differed significantly but not the albumen index and Haugh unit. GS

142

Umamaheswara Rao (S), Rao (BV), Zachariah (K) and Rao (KM). **Isolation and purification of yolk IgG (YIgG) from duck eggs.** *Indian Journal of Animal Science* 63(7); 1993; 720-723

The methodology of chlorofrom extraction from duck egg-yolk was standardized. The aqueous portion of the extract was rich in IgG when subjected to salt precipitation followed by fractionation and purification by gel-filtration and ion-exchange chromatography. The identity of IgG was established by immunoelectrophoretic studies. The yolk extract was the choice of biomaterial for fractionation and recovery of fairly pure IgG. AA

SEAFOODS

143

Yogamoorthi (A) and Sivashankar (A). **India's seafood export trend and its future prospects by 2000 A.D.** *Seafood Export Journal* 25(11); 1994; 19-34

The present status of marine fish production, seafood export and their growth rate were assessed; the avenues to produce and market diversified seafood items analysed; and projects the trend of marine fish production and seafood export by 2000 A.D. GS

Oysters

144
Chaupoehuk (P) and Raksakulthai (N). **Use of papain and bromelian in the production of oyster sauce.** *ASEAN Food Journal* 7(4); 1992; 196-199

Oyster meat samples were ground and mixed in screw-capped glass bottles with papain or bromelain, at concn. of 0, 0.1, 0.3, 0.5 and 0.7% (w/w). Oyster sauces (OS) prepared from 0.7% papain or 0.3% bromelain hydrolysates supplemented with NaCl showed no significant differences in proximate composition, pH, consistency and sensory evaluation scores. Chinese watercress stir-fried with these prepared OS was more acceptable (P less than or equal to 0.05) than commercial OS. The prepared OS had shelf-life of 12 wks at room temp. in glass bottles with screw caps. BV

Squids

145
Nagashima (Y), Ebina (H), Tanaka (M) and Taguchi (T). **Effect of high hydrostatic pressure on the thermal gelation of squid mantle meat.** *Food Research International* 26(2); 1993; 119-123

High pressure treatment was applied to squid meat paste in order to improve its lower thermal gelation ability. The meat pastes were compressed at up to 1000 MPa for 20 min with hydrostatic pressure and then heated in 2 ways; heated at 90°C for 30 min (one-step heating); heated at 35°C for 30 min followed by 90°C for 30 min (two-step heating). The breaking strength value of the gel formed by the pressure (400 MPa)-one-step heating treatment was twice as high as that of thermal induced gel. On the other hand, the value for gel with two-step heating was considerably lower than that with one-step heating. The deterioration of gels with two-step heating was completely supressed by pressurization at 800 MPa for 20 min prior to heating. Pressure treatment at more than 800 MPa could inactivate protease(s) involved in proteolysis of squid mantle muscle protein. These results indicate that high pressure treatment before heating was effective in inducing thermal gelation of squid meat. AA

Fish

146
Ismail (N) and Wootton (M). **Fish salting and drying: A review.** *ASEAN Food Journal* 7(4); 1992; 175-183

Aspects covered in this review are world production of dried fish; wastage, salting, the preservative action, methods of salting (kench salting, pickling, brining), salt penetration, drying, the theory of drying and factors affecting the drying rate of salted fish (thickness, temp., air velocity, RH, fat content, salt content). 71 references. SRA

147
Alwan (SR), Buckley (DJ) and O'Connor (TP). **Silage from fish waste: chemical and microbiological aspects.** *Irish Journal of Agricultural and Food Research* 32(1); 1993; 75-81

Fresh fish waste was manufactured into fish silage using formic acid to reduce pH to 3.5. The pH remained below 4.0 for up to 30 days. The chemical composition (g/kg) of silage varied with the type of raw material; moisture 726 to 803 (mean 764); oil 3 to 71 (mean 38); ash 35 to 72 (mean 51); protein 144 to 161 (mean 147). During the first 8 days after silage manufacture, concn. of low-salt-soluble and insoluble protein fractions decreased while the non-protein nitrogen content increased. Silage viscosity continued to decrease with time up to day 15. The ensiling process caused a sharp initial decrease in the total number of bacteria, in lactic acid bacteria and in coliform species followed by a more gradual decrease up to 48 h. A comparative study of silage manufactured from flat-fish frames (A) and round-fish heads (B) at pH 3.5 or 4.5, showed chemical composition (g/kg) of 726 and 777 moisture, 70 and 3 oil; 55 and 70 ash; 149 and 150 protein for A and B respectively. Silage viscosity showed greater decreases at pH 3.5 than at 4.5. Silage manufactured from round-fish heads showed greater viscosity decreases at both pH levels. AA

148

Huang (C-H) and Hultin (HO). **Soluble and bound iron equally effect lipid oxidation of sarcoplasmic reticulum**. *Journal of Food Biochemistry* 16(1): 1992: 1-13

Iron over the range of 25-250 MUM $FeCl_3$ in the presence of ADP and histidine bound in increasing amounts to fish sarcoplasmic reticulum. Binding of Fe was not reversed either by washing in water or after oxidation of the membrane lipid. There was no difference in the rate of lipid oxidation measured as TBA reactive substances catalyzed by Fe bound to the sarcoplasmic reticulum or by Fe in the soluble phase of the assay medium when expressed on an Fe basis. These results imply that for either bound or soluble Fe there is a common rate-determining step. In addition soluble and bound Fe were similar with respect to both inhibition by thiourea of their ability to catalyze lipid oxidation and their generation of hydroxyl free radicals measured by production of methane sulfinic acid from dimethyl sulfoxide in the presence of hypoxanthine and xanthine oxidase. AA

149

Chakrabarti (R). **Separation and prolongation of storage life of meat from small fish using dense media.** *ASEAN Food Journal* 8(3): 1993: 105-109

Dense media with sp. gr. 1.217-1.220 efficiently separated meat and bone from small fish. The Ca content in meat of lesser sardine in hand operated mincer was about 73 mg/100 g with av. moisture content (MC) of 78.14%, while the Ca content in meat separated by dense media was 55.0 - 60.4 mg/100 g with MC of 44.4 - 45.1%. Propionic acid in the media helped to control mould growth in separated meat and prolonged storage life up to 3-4 months at ambient temp. of 34 plus or minus 6°C. SRA

Cod

150

Dillon (R) and Patel (T). **Effect of cold smoking and storage temperatures on *Listeria monocytogenes* in inoculated cod fillets (*Gadus morhua*).** *Food Research International* 26(2): 1993: 97-101

Cod fillets samples (3) were inoculated with *L. monocytogenes* and cold smoked, vacuum-packaged and stored at 4°C for 3 wks or at -20°C for 3 months. The initial inoculation concn were 10^5 MPN/g in trial 1, 10^6 MPN/g in trial 2 and 10^1 in trial 3. Number of the organism remained stable during smoking process increased with storage at 4°C but decreased in cell number with storage at 20°C. Smoked seafood which are not cooked and contaminated with *L. monocytogenes* pose a health risk to consumers. BV

Hakes

151

Giannini (DH), Ciarlo (AS), Boeri (RL) and Almandos (ME). **Relationship between texture and some objective indices in frozen blocks of Argentine hake (*Merluccius hubbsi*) fillets.** *Lebensmittle-Wissenschaft und-Technologie* 26(2): 1993: 111-115

The relationship between texture of Argentine hake (*Merluccius hubbsi*) and 4 objective indices were studied at the storage temp. of -7, -15 and -32°C. The objective tests performed on samples taken from skinless fillet blocks were: centrifuge drip, salt soluble protein content, dimethylamine content and formaldehyde content. Linear relationships were obtained for the following pairs of variables: texture-salt soluble protein content and texture - centrifuge drip content. The texture-dimethylamine relationship was also linear at -32°C, but at -7 and -15°C, non-linear relationships were obtained. Because of the high degree of correlation (ranging from 0.92 and 0.98 for the different storage temp.) between dimethylamine and formaldehyde contents, the conclusions drawn from the texture-dimethylamine content relationships were also applicable to texture - formaldehyde content relationships. From the 4 objective texture indicative parameters studied detn of centrifuge drip was the only parameter to be considered as a useful texture indicator of frozen blocks of Argentine hake fillets, as the

corresponding relationship with texture was the only one that was non-temp dependent. AA

Mackerels

152
Suryaprakash Rao (V), Sudhakara (NS) and Punna Reddy (K). **Development and shelf life of ready to-serve frozen fish curry from Indian mackerel (*Rastrelliger kanagurta*)** *Indian Journal of Fisheries* 38(3); 1991; 169 172

A ready-to-serve frozen fish curry from Indian mackerel (*Rastrelliger kanagurta*) was stored at -20 plus or minus 2°C for 6 months and analysed for quality characteristics. A good correlation was observed between the sensory assessment and chemical parameters. Skinless and boneless flakes in curry were preferred over skin on and bone on steaks in curry. SRA

Salmon

153
Ohnuma (Y), Hatae (K) and Shimada (A). **Effects of curing on morphological and thermal properties of salmon-nose cartilage as vinegared dish in Japan.** *Journal of Food Biochemistry* 16(1), 1992; 31-41

Sliced salmon nose cartilage was cured in 4% acetic acid up to 168 h. Using optical microscopy reddish-purple colour produced by staining with toluisine-blue turned lighter during curing. This meant that the mucopolysaccharide level of cartilage matrix decreased, causing the structure of the cartilage to become porous. In addition, using scanning electron microscopy, loosenings of collagen fibers was observed after 72 h of curing thus making the structure of the cartilage fragile. DSC thermograms showed that the denaturation temp. of the native collagen fibers was lowered and an additional peak appeared during curing. These findings lead us to suggest that the collagen in salmon nose cartilage changes qualitatively during curing. AA

Infant foods

154
Sri Sumartini and Kantasubrata (J). **Available lysine in infant food after processing.** *ASEAN Food Journal* 8(3); 1993; 114-116

The aim of this study was to evaluate the detn. of the 1-Fluoro-2,4-dinitrobenzene derivative by HPL°C when applied to infant food and its raw materials during processing and storage. The results indicated that the available lysine of the extruded materials, including infant food formula VI were 15-30% < in the corresponding raw materials. The standard error of 5-15% was higher in the presence of carbohydrate. Storage over 2 months resulted losses of lysine of the order 8-48% at ambient temp. SRA

ALCOHOLIC AND NON-ALCOHOLIC BEVERAGES

155
Wucherpfennig (K). **Removing iron and copper ions out of beverages by means of selective complexing agents. Part 1. Singling out complexing agents.** *Deutsche Lebensmittel-Rundschau* 88(10); 1992; 313-317 (De)

Possibilities are shown to eliminate heavy metals with insoluble chelating agents. Yet not all of them are suited for the purpose envisioned since tests have shown that pectic acid, adsorber resins and cellulose hyphane are on the one hand not effective enough in the elimination of the heavy metals and will on the other hand change the wine's analytic numerogram or leave residues. Immobilized siderophores will bind only trivalent Fe and leave the more frequent bivalent unaffected. Other chelating resins could complex the Fe alright, but not the Cu. Well suited, it was found, are chelon resins together with imino diacetic acid as a functional group. Removal of Fe and Cu ions can be done in batches. The

analytic numerogram of the chelon-resin-treated wines remained practically unaltered. AA

156

Hellin (LC), Ruiz (LG) and Revilla (AZ). **Gas chromatographic determination of sugars and polyalcohols in apple liqueurs.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1); 1993; 49-52

This paper proposes a GC method to determine sugars and polyalcohols in apple liqueurs. The samples were prepared previously and the sugars determined as trimethylsilyl derivates. This technique enables isolation of the α and β anomeric forms of fructose, glucose and maltose. The precision and accuracy of the method has been verified. The liqueurs analysed are sweet liqueurs, as can be deduced from their high sugar content (over 100 g/L). Reducing sugars (glucose and fructose) were predominant. AA

Alcoholic beverages

Brandy

157

Gomez-Cordoves (C) and Bartolome (B). **Application of principal component analysis to simple determinations of brandies as a means of verifying quality.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 260-263

Phenolic composition of distillates aged in wood has been widely studied, thus giving rise to different standards that establish their genuineness and quality. The present paper sets out the results for classification of Spanish brandies and cognacs according to quality by applying analysis of variance and principal component analysis to the results of simple chemical (pH, phenol content) and physical (colour) detn. and/or the relationships between them. Chemical changes that occur during the aging process are related to these parameters. AA

Wines

158

Vaimakis (V) and Roussis (IG). **Must oxygenation and polyphenoloxidase inhibition and the oxidation of white wine.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 133-137

Experimental white wines were made by must oxygenation and by the addition of diethyldithiocarbamate (DDC) along with oxygen into the must. The inhibition of polyphenoloxidase activity by the addition of DDC led to white wines with high phenolic content, high browning capacity and potential development of pinking phenomenon. The experimental wines prepared by must oxygenation appeared to have low phenolic content (total phenolics, catechins and procyanidins), low absorbance at 420 nm and low value in the browning capacity test. This wine had a very good colour and good organoleptic quality even though it was not characteristic of wines from the grape var. used. The above indicate that must oxygenation can be used for removal of phenolic compounds in the production of table white wines. AA

Non-alcoholic beverages

Beer

159

Suihko (M-L), Vilpola (A) and Linko (M). **Pitching rate in high gravity brewing.** *Journal of the Institute of Brewing* 99(4); 1993; 341-346

The optimal pitching rate in high gravity worts (12-16°P) was about 0.3 g/l wet wt. (2.3×10^6 counted cells/ml) and per 1% of original wort gravity. In very high gravity worts (20-23°P) the corresponding figure was 0.4 g/l (2.9×10^6 cells/ml). Higher amounts of yeast did not improve the fermentation rate. With increased original wort gravity, flocculation of the yeast weakened and the amount of cropped yeast decreased. The viability of the crop yeast was good. In the conditions used, excessive production of acetate esters occurred only with pitching rates lower than the recommended rate. As the original wort gravity increased, more fermentable extract was metabolized to

ethanol rather than utilized for yeast growth. The highest ethanol yield obtained was 10.9% (v/v). AA

Coffee

160
Ramesh (K), Joginder Singh and Goyal (GK). **Effect of stabilizers on heat stability of coffee flavoured drink during sterilization process.** *Indian Journal of Animal Science* 63(7); 1993; 785-786

The coffee flavoured milk-based sterilized drink prepared using milk samples having acidity of 0.14, 0.15, 0.16, 0.17 and 0.18% (lactic acid) at varying levels of trisodium citrate (TSC) and di-sodium hydrogen phosphate (DSHP) as tabilizers. Results revealed that the coagulation could be effectively checked by using 0.1% or more TSC. 0.02% TSC is required to prevent coagulation of the beverage when prepared with milk having 0.17% acidity. Increased quantity of TSC (0.03%) is required to achieve the heat stability in the drink compared to DSHP. BV

161
Ratnayake (WMN), Hollywood (R), O'Grady (E) and Stavric (B). **Lipid content and composition of coffee brews prepared by different methods.** *Food and Chemical Toxicology* 31(4); 1993; 263-269

The lipid content (L°C) and composition of boiled, filtered, dripped, Turkish and espresso coffee from roasted beans of *Coffea arabica* and *C. robusta*, and of coffees prepared from different beans of instant coffee was examined. The LC varied with the method of preparation. Coffee brews filtered through filter paper contained < 7 mg lipids, those prepared by boiling without filtering and espresso coffee showed 60-160 mg lipids/150 ml cup. Coffee brew filtered through a metal screener contained 50 mg lipids/150 ml cup. Triglycerides (Tg) and diterpene alcohol ester (DAE) were the major lipid classes in coffee brewed from ground coffee beans, and ranged from 86.6 to 92.9 and 6.5 to 12.5% of total lipids, respectively. Coffee brews made from instant coffee, the levels of Tg and DAE were 96.4 - 98.5 and 1.6 - 3.6%, respectively. The LC of both regular and decaffeinated instant coffees varied slightly from one brand to the other, and ranged from 1.8 to 6.6 mg/150 ml cup. BV

Fruit juices

162
Chauhan (GS), Suresh (I) and Singh (D). **Formulation of fruit juice beverage from pulp.** *Beverage and Food World* 20(2); 1993; 17-18

Pulps and juice beverages prepared from apricot, peach and plum were analysed for total solids (TS), titratable acidity (TA), pH and viscosities. The beverage prepared with 20% pulp secured highest sensory score with a mean value of 7.75, 7.50 and 7.50, respectively for apricot, peach and plum and differed significantly (P = 0.01) from the beverages made from other ratio of pulp. The type of fruit did not exhibit significant difference on the acceptability of beverage. Stabilizer added samples in all beverages scored higher (P 0.01) sensory attributes. The apricot pulp showed highest values for TS, TA, viscosity and lowest pH and the peach pulp showed the contrary. SRA

Apple juices

163
Chauhan (SK), Lal (BB) and Joshi (VK). **Development of protein rich apple beverages.** *Research and Industry, India* 38(4); 1993; 227-229

Proximate composition, nutritional and sensory analysis of different blends revealed that apple juice (80%) and soy protein isolates (20%) were optimum to give a balanced, nutritious beverage, with substantially higher protein, fat, calorific value and minerals. Anti-nutritional factors like trypsin inhibition were completely lost in the product. GS

Citrus juices

164
Ulgen (N) and Ozilgen (M). **Determination of optimum pH and temperature for**

pasteurization of citrus juices by response surface methodology. *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1); 1993; 45-48

Optimization of microbial death, enzyme inactivation and vitamin C retention during pasteurization of pH-adjusted orange juice is discussed free of equipment dependent parameters such as the heating lag. The pH-temp. optimum was determined by response surface methodology in the range of 65-75°C and pH 2.5-4.0. The results implied that there was no pectinesterase activity below pH 3.5. *Leuconostoc mesenteroides* had its max and min thermal resistance at pH 3.5 and pH 2.7 respectively. For an ideal theoretical process requiring 4 log cycles of microbial reduction the optimum pasteurization conditions were 12 min at 75°C and pH 2.7. AA

Grape juices

165

Silva (JL), Ghaedian (R), Woods (F) and Garner (JO). **Physicochemical and sensory properties of muscadine grape juice and concentrates.** *Journal of Food Quality* 16(2); 1993; 81-90

Juice from bronze and red muscadines were concentrated by low-temp. vacuum evapoaration. Reconstituted juice showed inferior quality compared to single-strength counterparts. Blending conc. with single strength juice improved aroma and juiciness. Cellulases and pectinases did not alter quality except a slight increase in pH in red juice. Conc. and single-strength juice differed in colour but the reconstituted juice did not. SD

Kiwifruit juices

166

Wong (M) and Stanton (DW). **Effect of removal of amino acids and phenolic compounds on non-enzymic browning in stored kiwifruit juice concentrates.** *Lebensmittel-Wissenschaft und - Technologie* 26(2); 1993; 138-144

The effect of the removal of phenolics and amino acids, and initial oxidation of ascorbic acid on non-enzymic browning in kiwifruit juice concentrate during storage at 20°C was investigated. Kiwifruit juice was passed through cation exchange resin Dowex 50W and/or adsorbent resins Amberlite XAD-4 and XAD-2, to remove amino acids and phenolic compounds. The extent of the initial oxidation of ascorbic acid which occured during treatments was determined before concn. After the initial storage period, during which products from ascorbic acid oxidation were most reactive, the browning rates in concentrates which had approx. 90% of the amino acids removed were half that of the control. Initial oxidation of ascorbic acid led to an initially accelerated browning rate, which affected the overall browning occurring during storage. Removal of amino acids with minimal oxidation of the juice produces a kiwifruit juice concentrate with the least overall browning during storage, while removal of phenolic compounds does not appear to be beneficial procedure for the control of browning in kiwifruit juice concentrate. AA

Orange juices

167

Tepper (BJ). **Effects of a slight colour variation on consumer acceptance of orange juice.** *Journal of Sensory Studies* 8(2); 1993; 145-154

342 consumer panel did not prefer, particularly the older panelists, the green off-colour imparted juice but were not influenced on ratings of flavour or sweetness or overall liking. SD

168

Moshonas (MG), Shaw (PE) and Buslig (BS). **Retention of fresh orange juice flavour and aroma in an aqueous distillate from Valencia orange juice.** *Journal of Food Quality* 16(2); 1993; 101-108

Freshly squeezed Valencia orange juice, distilled at low temp. and reduced pressure, yielded an aqueous distillate with the necessary balance of volatile flavour and aroma constituents to retain the fresh juice

characteristics. Flavour comparisons by an experienced sensory panel determined that orange juice reconstituted by combining the aqueous distillate with the residual juice solids had significantly more fresh juice character than reconstituted commercial frozen conc. orange juice; commercial not pasteurized single strength orange juice (SSOJ); pasteurized SSOJ, not from conc.; canned SSOJ, from conc.; or aseptically packed SSOJ, from conc. The panel also found no significant difference in fresh juice characteristics between freshly squeezed orange juice and distillate and residual solids recombined from the same juice sample. Fifty four volatile constituents were identified from the aqueous distillate of freshly squeezed orange juice. AA

Tea

169

Price (WE) and Spitzer (J-C). **The temperature dependence of the rate of extraction of soluble constituents of black tea.** *Food Chemistry* 46(2); 1993; 133-136

The temp. effect on the infusion of solubles from black tea leaf (Nerada, and Australian CTC tea) was assessed through UV active solubles present by spectrophotometric analysis. The activation energy of 41 kJ/mol. obtained for the infusion of solubles was higher than the literative value. The findings are consistent with the rate-determining step being the hindered diffusion of a soluble constituent through the leaf matrix. SD

170

Engelhardt (UH), Finger (A), Herzig (B) and Kuhr (S). **Determination of flavonol glycosides in black tea.** *Deutsche Lebensmittel-Rundschau* 88(3); 1992; 69-73

An HPLC method for the detn. of flavonol glycosides from tea has been developed. Compounds were extracted by methoanol and aqueous methanol (70%). Clean-up was carried out by polyamide column chromatography. Using two isocratic systems separation of 14 flavonol glycosides was possible. The black teas analysed (n = 25) had a total amount of flavonol glycosides from 0.38 to 1.7% dry wt. Teas from either the Darjeeling district or from Kenya had similar flavonol glycoside patterns while in Sri Lanka teas there were two groups. Assam teas showed different patterns. Flavonol glycoside pattern seems to be basically useful to detect geographic origin of tea samples, however additional detn. and data treatment by means of statistical methods are necessary. AA

171

Nas (S), Gokalp (HY) and Sahin (Y). **K and Ca content of fresh green tea, black tea and tea residue determined by X-ray fluoresence analysis.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 196(1); 1993; 32-37

X-ray fluoresence (XRF) can be successfully used for the qualitative and quantitative elemental analysis of various agricultural products. Its simplicity, high throughput and the possibility of automation make it useful for screening large number of samples. The K and Ca content of 138 samples of fresh green tea, black tea and black tea residues were determined by applying the XRF system. Such a method of mineral analysis of food products is not very common. Tea from different tea growing areas of Turkey, green tea of different shooting periods, black tea processed at different tea plants and tea residues from these black tea and tea residues after brewing were found to have ranges of 19,049-26,254 mg/kg, 21,904-26,883 mg/kg and 9,468-13,778 mg/kg, respectively. In the same samples the Ca content was determined as 3,580-4,799 mg/kg, 3,370-4,823 mg/kg, and 3,743-5,733 mg/kg, respectively. These findings were compared with the results of atomic emission techniques and it was concluded that the XRF system could be effectively used for quantitative analysis of the K and Ca content of tea samples. AA

172

Engelhardt (UH), Finger (A) and Kuhr (S). **Determination of flavone C-glycosides in tea.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 239-244

Reports HPLC method for the detn. of flavone C-glycosides (FCG) from black tea. The FCG detected were Apigenin

6-C-glucosyl-8-arabinoside, apigenin 6-C-arbinosyl, 8-C-glucoside, luteolin 6-C-glucoside, apigenin 8-C-glucoside, apigenin 6-C-glucoside and apigenin 6,8-di-C-glucoside. The FCG were quantified in a var. of teas of different origins (16 black, 2 green and 1 oolong). The total amount of the FCG were 0.48 - 2.69 g/kg dry wt. The FCG pattern of teas of different origins were similar to each other and no origin-dependent characteristics was observed. Small amounts of FCG (1.2 - 2.2 mg/g) were detected in hydrolysates of high relative mol. mass fractions (Mr > 5000) of a black tea liquor. BV

FATS AND OILS

173

Schwarz (W), Zajic (J) and Brat (J). **Investigations of the polymerization of fatty acids. I. An influence of reaction conditions on the course of polymerization process.** *FAT Science Technology* 95(7); 1993; 253-257 (De)

In the present paper some technological conditions of the polymerization of rapeseed oil fatty acids were studied. The temp., water content and pressure had determinating influence on polymerization velocity when the bentonite type of catalyst was used. With respect to yield of dimeric fatty acids water content of 1-2 wt. % and pressure 0.4 - 0.6 MPa are the most favourable values. With temp. above 160°C an increasing decarboxylation of fatty acids has taken place. AA

Oils

174

Ulberth (F) and Roubicek (D). **Evaluation of a static headspace gas chromatographic method for the determination of lipid peroxides.** *Food Chemistry* 46(2); 1993; 137-141

Thermal treatment to oil samples was given by means of air-forced oven instead of heating the oil in HS sampler. An inert atm. (N_2) in vials used for thermal treatment is necessary for reproducible results. Flame-sealed ampoules instead of crimp capped HS vials were used to avoid leakage after cooling down the hot vials. Thermostating the oil samples for 1 h at 60°C was found necessary to reach equilibrium. Headspace GC quantified the decomposed components of lipid peroxides, viz. pentane, hexanal, *trans*-2-heptenal on heating to 140°C for 30 min. The modified procedure improved the repeatability of the method. SD

Rapeseed oils

175

Drigolla (VP) and Pudel (F). **The direct hydrogenation of TOP-rapeseed oil.** *FAT Science Technology* 95(7); 1993; 241-248 (De)

This study reports about experimental examinations for the direct hydrogenation of TOP-rapeseed oil in the lab. scale with the aim of the test of various catalysts, quantitative detection of the influence of hydrogenating inhibitors in the TOP-rapeseed oil, optimization of parameters of the hydrogenating process. BV

SPICES AND CONDIMENTS

176

Shankaracharya (NB) and Raghavan (B). **Natural and synthetic flavours and their safety.** *Beverage and Food World* 20(2); 1993; 7-12

This article briefly describes: raw materials used by flavourists, sources of natural flavouring materials, synthetic and biosynthetic flavours, nomenclature and classification of flavours, flavouring, natural aromatic raw materials, natural flavouring substances, natural identical flavourinmg substances, natural with- other-natural-flavours, flavour potentiators, need for flavour legislation, flavour regulations, positive list system, negative list system, mixed list system, problems in flavour regulations, process flavours, enzyme and microbiological flavours, pyrolysis flavours, organisations and agencies working on flavour legislation and safety, F.D.A., FEMA, codex, joint expert committee on flavour additives, International organization of

the flavour industry (IOFI), Geneva, the Council of Europe-Strasbourg; France, National flavour association, Food Chemical codex committee and flavour safety. SRA

Essential oils

177
Mahia (PL), Gandara (JS) and Losada (PP). **Infrared spectrophotometric determination of citral corrected for limonene interference in lemon and orange essential oils.** *Food Chemistry* 46(2); 1993; 193-197

An infrared spectrophotometric method is described to correct for interference by limonene in the detn. of citral in orange and lemon essential oils by substracting the limonene spectrum from the essential oil spectrum. The first derivative trough-to-peak distance between 1684 cm^{-1} and 1677 cm^{-1} was most reliable in determining citral, parameters of the zero order absorption spectrum (net absorbance and peak area) performed poorly in comparison. AA

Spices

Capsicum

178
Yuen (CMC) and Hoffman (H). **New capsicum varieties: Storage suitability and consumer preference.** *Food Australia* 45(4); 1993; 184-187

A field and storage trials (at 8.5°C, from 9 to 20 days) were conducted on 45 new Capsicum cvs, and survey of consumer's attitude to capsicum quality, size, shape and colour and usage. Most consumers liked small to medium, flat round, crisp, blemish-free red capsicums. Only 40% of consumers surveyed indicated that capsicum available was good. About half were prepared to pay a higher price for better quality capsicums. Usage of capsicum was evenly divided between salads and cooking. SRA

Mustard

179
Cui (W), Eskin (NAM) and Biliaderis (CG). **Chemical and physical properties of yellow mustard (*Sinapis alba* L.) mucilage.** *Food Chemistry* 46(2); 1993; 169-176

The yield of crude mucilage (CM) from yellow mustard was 5% of total seed wt. CM was separated into 55.6% water-soluble fraction and 38.8% water-insoluble fraction. CM showed 80-94% carbohydrates, ash 1.7 - 15% and protein 2.2 - 4.4%. Also it showed 22.35% glucose, 11 - 15% galactose, 6.0 - 6.4% mannose, 1.6 - 4.0% rhamnose, 2.8 - 3.2% arabinose and 1.8 - 2.0% xylose. All mucilage fractions exhibited interfacial activity, shear thinning behaviour typical of xanthan gum dispersions and the water-soluble fraction was least affected by pH, temp. and solutes (NaCl, sucrose). SD

180
Niazi (AHK) and Shah (FH). **Mustard protein concentrate: A potential source for food stuffs.** *Bangaldesh Journal of Scientific and Industrial Research* 27(3/4); 1992; 102-113

Ten Pakistani traditional dishes Allu kabab (potato cutlets), Barian (spiced pulse balls), biscuits, dahi babrae (cultured milk gram cutlets), gram rice maroonda (gram snacks), laddu (sweet balls of roasted grams), missi roti (spiced Pakistani bread), Pakorae (fried gram flour balls), rice maroonda (rice snacks), Seikh kabab (meat roll) and shami kabab (meat gram cutlets) were incorporated with mustard protein concentrates (MPC). Protein contents of dishes increased from 6.41 to 97.73%. Sensory evaluation showed that MPC fortified dishes were readily acceptable. BV

Pepper

181
Piggott (JR) and Othman (Z). **Effect of irradiation on volatile oils of black pepper.** *Food Chemistry* 46(2); 1993; 115-119

Steam distilled volatile oils of black pepper from 3 sources, untreated and treated with 10, 20 and 30 kGy doses of gamma radiation were analysed by capillary GC at 1, 30 and 90 days storage at 24°C. There was no systematic change in volatile oil content with radiation

dose or storage period, but principal component analysis of data showed clear difference between control and irradiated samples of 2 peppers immediately after treatment; and upon storage the differences reduced. There was no changes in the third sample due to radiation. SD

182

Minguez-Mosquera (MI), Jaren-Galan (M) and Garrido-Fernendez (J). **Lipoxygenase activity during pepper ripening and processing of paprika.** *Phytochemistry* 32(5); 1993; 1103-1108

The crude enzymatic extract obtained directly by tituration of the fruits of *Capsicum annuum* in phosphate buffer followed by filtration was shown to be suitable for the measurement of lipoxygenase activity. The use of Triton X-100 did not improve extraction and the use of DTT to protect the enzyme against oxidizers was not necessary. The optimum pH was 7 for the extraction and 6.5 for measurement of activity. The number of previous harvests from the plant had a marked effect on the levels of lipoxygenase activity during ripening of the fruits from two var. of pepper. During drying, there was a progressive loss of activity in both var. AA

183

Kowalski (E), Ludwig (H) and Tauscher (B). **Hydrostatic high pressure to sterilize food. I. Application to pepper (*Piper nigrum* L.).** *Deutsche Lebensmittel-Rundschau* 88(3); 1992; 74-76 (De)

Black pepper, at 40°C, was exposed to hydrostatic pressure up to 4000 bar. This led to a decrease by several orders of magnitude in the number of viable microorganisms on both natural pepper and pepper which had been contaminated by defined doses of *B. cereus* spores. Kinetic studies have shown that the course of inactivation can be described by a reaction order between 1, 5 and 2. A reduction of counts was achieved only in the presence of an aqueous medium, however, in dry pepper, the treatment failed. After exposure to pressure, there was a minor change in the relative proportions of the various volatile oils and in those compounds responsible for the pungent taste of the pepper. AA

184

El-Dessouki (S). **Aflatoxins in cayenne-pepper and paprika-powder.** *Deutsche Lebensmittel-Rundschau* 88(3); 1992; 78 (De)

Fifteen random samples of paprika powder and 24 random samples of Cayenne pepper powder were analysed for aflatoxins. Seven of the paprika samples contained aflatoxin B_1 and B_2 up to 15.3 µg/kg total aflatoxins. 13 of the Cayenne pepper samples contained aflatoxin B_1, B_2 and G_1 up to 218 µg/kg total aflatoxins. AA

Turmeric

185

Yasni (S), Imaizumi (K), Nakamura (M), Aimoto (J) and Sugano (M). **Effects of *Curcuma xanthorrhiza* Roxb. and curcuminoids on the level of serum and liver lipids, serum apolipoprotein A-I and lipogenic enzymes in rats.** . *Food and Chemical Toxicology* 31(3); 1993; 213-218

The effects of *C. xanthorrhiza* Roxb. (commonly known as temus lawak or Javanese turmeric in Indonesia) on serum and liver lipids, serum high density lipoprotein (HDL)-cholesterol and apolipoprotein A-I and liver lipogenic enzymes were studied. In rats fed a cholesterol-free diet, *C. xanthorrhiza* decreased the concn. of serum triglycerides, phospholipids and liver cholesterol and increased serum HDL-cholesterol and apo A-I. Rats fed high-cholesterol diet, *C. xanthorrhiza* did not supress the elevation of serum cholesterol, although it decreased liver cholesterol. Curcuminoids prepared from *C. xanthorrhiza* had no effect on the serum and liver lipids. GS

SENSORY EVALUATION

186

Bertino (M) and Lawless (HT). **Understanding mouthfeel attributes: A multidimensional scaling approach.** *Journal of Sensory Studies* 8(2); 1993; 101-114

Multidimensional scaling (MDS) was used to study qualitative relationships among mouthfeel attributes encountered in oral healthcare products. Similarity estimates were obtained from a rapid sorting task and from pairwise similarity ratings. Configurations were interpreted as suggesting four groupings of oral sensations: numbing, astringency, pain and taste. The pain-associated sensations were futher differentiated into thermally related sensations and chemically related sensations in some configurations. Two-dimensional solutions from the sorting task and from group-averaged similarity ratings were similar. Individual differences scaling solutions, however, showed unacceptably high stress in two dimensions, suggesting additional nuances in meaning to individual panelists that were not captured by group-averaged data or by sorting data. AA

187

Tuorila (H) and Vainio (L). **Percieved saltiness of table spreads by varying fat compositions.** *Journal of Sensory Studies* 8(2); 1993; 115-120

Four types of spread with 80% fat, but varying in the origin of the fat (milk/vegetable) and in the proportion of oil versus solid fat (0-90% vegetable oil), were manufactured at NaCl concn. of 1.0, 1.5 and 2.0%. Their saltiness and degree of melting in the mouth were rated using the time-intensity (TI) procedure. The perceived max. saltiness of each NaCl concn. varied widely, samples with 80% milk fat + 20% vegetable oil being the most salty and those with 15% vegetable fat + 85% vegetable oil the least salty. The differences in saltiness were not directly related to the degree of melting in the mouth. The results demonstrate that extrapolating saltiness on the basis of NaCl contents over brands of products would be risky, since saltiness and NaCl contents are not necessarily correlated even in apparently similar products. AA

188

Chambers (EIV) and Smith (EA). **Effect of testing experience of performance of trained sensory panelists.** *Journal of Sensory Studies* 8(2); 1993; 155-166

Inexperience and experienced panel with similar training evaluated a product class that the experienced panel had tested extensively and another product class unfamiliar to both the groups. Results indicate that intensive training is more important than experience for intra panel consistency. SD

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

189

Schwack (W) and Kopt (G). **Photodegradation of the carbamate insecticide pirimicarb.** *Zeitschrift Fuer Lebensmittel-Untersch und Forschung* 197(3); 1993; 264-268

In order to study the photoreactivity of pirimicarb (2-(dimethylamino)- 5, 6 - dimethyl-pyrimidi-4-yl-N-dimethylcarbamate) on plant surfaces, model experiments with organic solvents were performed. Pirimicarb decomposed readily when irradiated ($\lambda > 280$ nm) in the presence of the selected model solvents to form a number of products. Half-lives were in the order isopropanol < cyclohexane < cyclohexene (up to a max. of 140 min). In the presence of all 3 solvents photooxidation predominated leading to N-formylpirimicarb and, in the second step, to N-desmethylpirimicarb as well as to further oxygenated products with the carbamate moiety intact. Photolysis in cyclohexene resulted in photomineralisation as the main degradation pathway. Irradiation of pirimicarb in the presence of isopropanol also yielded an addition product of the parent compound with the secondary alcohol. AA

190

United Phosphorus Ltd. **Workshop on phosphine as a fumigant - a critical appraisal. June 24th - 25th 1993, Mysore.** 66; 1993

Abstracts of various papers presented at the proceedings such as Aluminium phosphide

fumigation of sorghum in Sudan by Krishnamurthy, K. (pp. 7-9); the fumigation of grains using Al phosphide by Deshmukh, P. B. and Gover, K. S. (pp. 9); Control of major pests of copra with phosphine fumigation by Nalina Kumari, T., Mammen, K. V. and Visalakshi, A. (pp. 10-11); role of phosphine in the protection of plantation products and processed foods by Narasimhan, K. S. and Jayaram, M. (pp. 11-12); the deciding factors for effective grain fumigation with phosphine under the existing storage conditions in India by Rajendran, S. (pp. 15-16); effect of aluminium phosphide on seed viability and insect infestation of paddy, sorghum and Bengal gram by Shekar Shetty, H., Narasimhan, K. S. and Raghunathan, A. N. (pp. 16-17); importance of gas proof sheet/cover in fumigation of agricultural commodities and processed foods with phosphine in milled grain products, spices and beverages by Rema Devi, K., Visalakshi, A and Naseema Beevi, S. (pp. 35-37); the interaction of phosphine with food constituents by Godavari Bai, S. (pp 46-47); status and prospects of safe mineral protectants in storage of grains by Venugopal, J. S. and Putte Gowda (pp. 50-51); Pesticide residues in food-beef for standard analytical techniques by Handa, S. K. (pp. 53-54) is discussed. CSA

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191

Hirose (M). **Molten globule state of food proteins.** *Trends in Food Science and Technology* 4(2); 1993; 48-51

Reviews the molten globule state which is an intermediate state for food proteins between the native and denatured conformations; its role in the functional properties (gelation, emulsification and foaming) of foods. 29 references. GS

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Filer (LJJr). **Special issue of a proceedings on a workshop on child and adolescent obesity: what, how and who ?.** *CRC Critical Reviews in Food Science and Nutrition* 33(4/5); 1993; 287-430

193

Thompson (LU). **Potential health benefits and problems associated with antinutrients in foods.** *Food Research International* 26(2); 1993; 131-149

Reviews the problems and benefits associated with the antinutrients such as phytic acid (PA), lectins, phenolic compounds (tannins), saponins, enzyme inhibitors (amylase and protease) and triglycerides. The health benefits highlighted are lowering of blood glucose and hormonal responses, reduction of blood lipids and reduction of cancer risks and other benefits. 352 references. GS

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Kinsella (JE). **Advances in food and nutrition research.** 37.; 1993; 1-437

This volume covers on food, diet and gastrointestinal immune function by Pestka, J. J. (pp. 1-66); effect of consumption of lactic cultures on human health by Sanders, M. E. (pp. 67-130); defining the role of milk fat in balanced diets by Berner, L. A. (pp. 131-257); biochemistry of cardiolipin: sensitivity to dietary fatty acids by Berger, A., German, J. B. and Gershwin, M. E. (pp. 259-338); diseases and disorders of muscle by Pearson, A. M. and Young, B. (pp. 339-423). CSA

TOXICOLOGY

195

Azimahtal (HLP) and Tey (LY). **Enzyme-linked immunosorbent assay for aflatoxin B_1** in cereals and peanuts. *ASEAN Food Journal* 7(4); 1992; 209-211

Two white New Zealand rabbits were injected with 100 µg conjugated aflatoxin B_1 (AFB_1). The initial criteria for the validation of an indirect competitive enzyme-linked immunosorbent assay (ELISA) for AFB_1, was the setting up of a sensitive standard curve using sufficiently high titre of anti-aflatoxin antibody and high specificity to the antigen aflatoxin. The titre of the two rabbits at their max. after 10 wk of priming injection showed a titre of > 50.00 after 6 wk of priming. The ELISA had a sensitivity of 0.015 µg/mL and working

range of upto 20 µg/mL at specific dilution of antibody and conjugated IgC peroxidase. Peanuts, corn, wheat, barley, soy beans and peanut butter extracts prepared for un contaminated samples did not show significant inhibition in the ELISA. The av. recovery for corn spiked with 1 µg/mL, AFB_1 was 80%, for peanuts 80%, for wheat 77%, for barley 75% and for peanut butter 80%. Almost identical results were obtained for samples spiked with 2 µg/mL AFB_1. SRA

196

Chinnaswamy (N), Harish Kumar (N), Uday Kumar (P) and Rukmini (C). **Toxicological studies on debitterized neem oil (*Azadirachta indica*).** *Food and Chemical Toxicology* 31(4); 1993; 297-301

Neem seed (NS) contains 45% oil and is a minor oil of considerable potential. A three-generation study carried out in 15 male and 15 female rats fed diet containing 10% NSO is reported. Mutagenicity test of NSO was found to be negative in Ames test and NSO devoid of all the bitter and odoriferous principles may be recommended as safe for consumption by humans. BV

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Aulepp (H) and Vieths (St). **Problems of food allergies.** *Deutsche Lebensmittel-Rundschau* 88(6); 1992; 171-179 (De)

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Mardsen (J) and Pesselman (R). **Nitrosamines in food-contact netting: Regulatory and analytical challenges.** *Food Technology* 47(3); 1993; 131-134

The history, chemistry and potential carcinogenic effects of nitrosamines has been documented in this article. The material and data included in this article intend to present an overview of the events leading to the filing of a food additive petition and an outline of the testing plan. The results conclusively show a reduction in the levels of nitrosamines detected in crude-meat products processed in elastic-rubber netting. CSA

FOOD LAWS AND REGULATIONS

199

Pruthi (JS). **International legislation of food irradiation - present scenario.** *Beverage and Food World* 20(2); 1993; 19-22

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Sinha (KK). **Mycotoxins.** *ASEAN Food Journal* 8(3); 1993; 87-93

This review deals with the problem of mycotoxins and particularly aflatoxins in different parts of the world. Covers, important mycotoxins and mycotoxin producing fungi, natural occurrence of mycotoxins, factors affecting mycotoxin contamination, toxic effects of mycotoxins and control of mycotoxins. 83 references. SRA

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